

# dataweek



No 8 May 6 1970

Steinberg and Leasco



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# The investment scene

For several years City people have been subjected to more or less subtle complaints to the effect that stodgy old merchant banks and others of their ilk were strangling the poor old technocracy by refusing to invest in high-risk super-techno-ventures. Fingers of gloom have been pointed, and soothsayers have pointed out quite sensibly that the place one had to go for that kind of money was Wall Street.

This seems like an appropriate moment to point out that the two areas which blossomed most magnificently in the last few years—time-sharing and leasing—suffered soonest and worst in the miasma of their own self-created credibility gaps when the skittish market in the US began to behave like an emperor who has heard the children asking about his new clothes.

Saul Steinberg put the New York market madness nicely at Data Decade: if you tell the market things are pretty bad, and will remain so for the next nine months four days and three hours, your stock tends to go up. If you tell the market things will be pretty good for your company for the next two years three months and twelve days your stock tends to go up. If you imply or say 'I dunno,' the poor sophisticated market has a neurosis and drops absurdly.

It's perfectly clear to most fiscal soothsayers that there is a major recession gallumphing around in the States. Its first signs began to show about 15 months ago, as ventures on the order of Bloggs Time-Sharing and Jones Technology Inc failed to soar—and with them some very reputable new issues.

In the meantime, happily, US companies with UK branches report that results here are consistently encouraging.

NSF

## dataweek

The news review of data processing

This issue of DATAWEEK is sent to over 40,000 executives and specialist staff. Anyone wishing to be considered for the free circulation should send name, home address, and details of position to Roy Astle, Circulation Manager, PO Box 4, Station Road, Filton, Bristol. DATAWEEK is published weekly by Business Publications Limited, Mercury House, Waterloo Road, London SE1 (01-928 3388) and printed by Fisher Knight & Co, Ltd, St Albans. Registered at the GPO as a newspaper. Scottish Branch Manager: George M Moffat, 5 Mauricewood Road, Penicuik, Midlothian, Scotland. Tel: Penicuik 2702.

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# OUTLOOK

## Predictions for the 'silly season'

As summer approaches and the immediacy of new computer products fades into the immediacy of new sunburn unguents, there will be more room for the pseudo-philosophical issues, the oddball items, and the real (and worthwhile) contemplative moments.

We see two issues, in particular, that are likely to permeate the computer press before the summer is over. Impetus for each of these is likely to come from the House of Commons, which is likely to have an intensified 'silly season' of its own. But the issues are far from silly.

The two serious matters in question are privacy and education. On the privacy front, it is becoming increasingly clear that at least one member of the all-star, all-party investigating committee is collecting ammunition. Every session of Subcommittee D sees the same quiet question from Eric Lubbock: What are the implications, the costs, the probabilities, of having social security and inland revenue records mixed in one giant database? Most technical testifiers pooh-pooh the notion, and we can understand their lack of concern, but it is beginning to be clear that the availability of large, cheap storage media gives the question an immediacy that is well deserved. Already some government departments—and even local authorities—are planning such comprehensive data bases. The Inland Revenue system, when completed, will form a vast mass of information about every taxpaying person in the UK. Only the poor will have privacy! And one local authority is on record as saying it hopes to be operating a file giving the exact location plus a wealth of personal details about every man, woman and child in its county, before the end of the decade. Post facto exploration of the privacy question would be not only absurd but impossible, because the degree of personal infringement could never be freely explored or admitted.

The education question pops up every year or so, like a cork. In the spring of 1968 MP John Hunt asked some extremely pertinent parliamentary questions, ably backed by Eric Lubbock speeches, about questionable computer schools, especially those which prey on new Commonwealth arrivals in return for huge fees. The result of the 1968 'schools controversy' was that most of the more dubious schools simply disappeared from the London scene.

They are beginning to reappear, and it would be reasonable to assume that it will take Government action to focus sufficient attention on these abuses in the national press to make any impact on the commercial bonanza.

## Obscurity versus security

Subcommittee D and the Ministry of Technology squared up at each other across the investigators' tables with the cheerful postures of seasoned prizefighters. The Subcommittee attacked effectively on several points, with varying results.

The Ministry's contention that the Government, acting as a customer, saw no reason to reveal the reasons for its selections, ducks the issue of responsibility to taxpaying citizens for the disposition of their funds.

The suggestion that the Ministry should, perhaps, view computers as something more vital than office machines, tended to sound valid.

The accusation that Government policy was deliberately obscure was superbly handled—if the word 'British' can't be defined any more precisely than it is, how can the nuances of purchasing policy hope to be tied down by anything more binding than 'guidelines,' the Ministry responded.

## This week in Dataweek

Catching a man as busy as Saul Steinberg for an extended interview is a journalistic achievement of no small note. The American visitor was gracious enough to grant an 8.30 am interview, and offered a very pleasant photograph. But *Dataweek's* freelance photographer Eric Lockrane, normally a nightbloomer, met the dawn challenge with a series of exclusive Steinberg photos that threw previous cover plans into chaos. The resulting article on pages 6-7 particularly highlights Steinberg's views on acquisition and disacquisition of subsidiaries and staff.



## Celia . . . the brainy salesman

She's blonde and blue-eyed, with a stunning figure and long legs . . . and she sells computers. If the figures 36-24-36 are mentioned, they certainly don't refer to bytes, disk packs and core storage.

Celia Bogan is also a brainy bird, second-in-command of the British marketing operation of a multi-million dollar American company.

She works for Boothe Computers, the big-time leasing operation bossed from San Francisco by Paul Williams Jr.

Celia has worked for the company since it started European operations in 1968. Her entry into the profession was accidental and astonishing.

Lounging in a deep black leather armchair in Boothe's plush Mayfair headquarters, Celia told of how a part-time typing job became a full-time career.

"In the summer of 1968, I returned, with no money, from a trip to the United States which I'd undertaken during my vacation. I intended to return for my third year at university, where I was studying German.

"The third year I was going to spend in Germany, and I needed some money, so I decided to get a temporary job.

"I went to an agency on a Friday afternoon, and the woman there said: 'What are you doing this afternoon?' There were two men in the next room who wanted a report typed immediately, and she was doing it until a girl turned up.

"I typed the report. It was for a Canadian who had just arrived in London. With an Englishman he was setting up the British Boothe Computer operation.

"They were charming people, and offered me a temporary job for the next few weeks. It sounded interesting so I took it.

"The new company found temporary offices in Regent Street, and we formed the British and European operations."

During those first frenetic weeks, Celia's linguistic talents—she speaks French as well as German—were useful.

"These Americans don't go in for writing formal letters," she says with approval. "They just pick up a telephone and call someone. I was able to help contact people in Europe.

"After a few weeks, they offered me a full-time job. I liked the people and took it. I got a lot out of my two years at university, but I felt that the academic world was far removed from reality.

"I saw the people at my college. I didn't want to make an irrevocable step. I arranged that if I decided I didn't like the job, I could come back after a year.

"I have this philosophy that you should take advantage of opportunities that are offered. I think that because you start in a particular path, that doesn't necessarily mean that you have to stick at it. You have to be flexible."

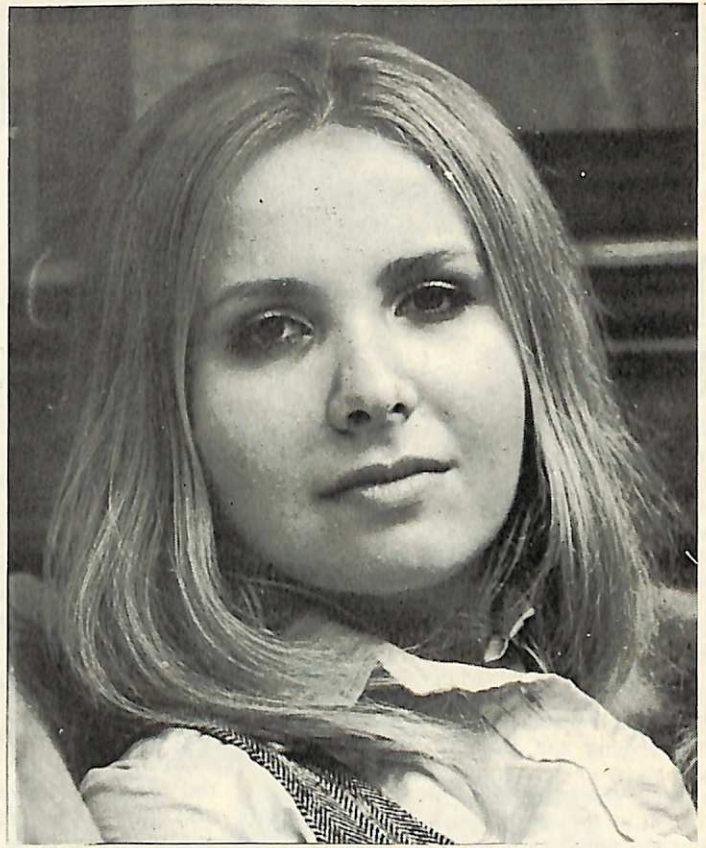
This has always been Celia's opinion. Although she is decidedly feminine, Celia is no shrinking violet. She has positive views which she's not afraid to express. And never has been.

"At 16, I was at a grammar school—an all female environment. This wasn't my scene. It was petty and catty. I decided to go to Ealing Technical College.

"There, I did a bi-lingual secretarial course, and French and German A levels. I took advantage of a reciprocal arrangement for the exchange of people studying technical subjects and went to Sweden for two months."

This experience was useful to her when she started working for Boothe. At first, she worked as personal assistant to the managing director. The job involved finding places to live for the company's American newcomers and 'phoning companies.

"The Americans have a great deal of difficulty adjusting. Having just spent almost three months in the US, I had a good understanding of their problems."



Since January, Celia has been a salesman—she prefers to be called a sales-man rather than a saleswoman.

"My job involves contacting prospective clients we want to buy from or lease to. Then I have to meet them, and then work out the proposals for the final deal. We are dealing mainly in used equipment. I also check up on the computer's delivery."

The company has to re-lease returned equipment, and so is in constant touch with the market. At least four months' notice is given of a company's intention to terminate its leasing agreement.

"During those months you hope you will find a new customer," Celia says. "IBM's delayed British unbundling has helped in re-leasing."

Chatty Celia appreciates the significance of her work. During a two-hour monologue she gave her views on a wide variety of subjects.

On Paul Williams, managing director of Boothe Computers: "I like him very much. He's a very personable and very clever man. He has a deep understanding of leasing and the computer."

On the British operation of Boothe Computers: "We finished the first stage of operation at the end of 1969. During 1970 we will widen our portfolio of equipment.

"The company is looking for new areas to put money in. These could include terminals, software and consultancies.

"Terminals will be a key factor in the future. There will be a tendency to centralise work on big computers in the 1970s and this will mean that more terminals will be needed."

On her work as a salesman: "We don't engage in high pressure salesmanship. We are offering a financial deal. We can show dp managers how to keep the capacity of their installations and yet save money. You need a grasp of the financial deal.

"I sometimes think: is what I'm doing really benefiting mankind. Computers have got a bad image. They tend to come off badly in films. I'd like to do a bit to change that image."

On the business world: "There ought to be compassion in the business world. We live in a social world, and we can't be insensitive to others. We can't tread over other people."

On being a woman in a man's world: "Some men think it's quite a novelty to be 'phoned by a woman. The trouble is, they may think 'She sounds nice on the 'phone. She might liven up an afternoon.'

"Personality is very important. A woman should never seem high-powered. I do feel it's important not to lose your femininity."

For Celia, that should prove no difficulty.



## Procurement policy not 'obscure' says MinTech

Government computer procurement policy is to purchase British machines 'whenever reasonably possible,' with each case judged on its merits. Price is only one, but an important one, of many factors considered.

This was how representatives of the MinTech stated Government procurement policy at last Wednesday's meeting of Subcommittee D. I. Maddock, controller of Industrial Technology at MinTech, told the committee that as a customer "the Government behaved no differently from other customers."

Maddock denied that computer manufacturers were confused about what Government procurement policy actually was. "I would have thought no computer manufacturer is in the least confused about this. I don't think the industry is confused about MinTech."

Maddock sternly rebuffed suggestions that MinTech's policy is consciously 'obscure' and that the Government has not followed its stated policy.

"This is not something which is susceptible to the laying down of precise guidelines. It is difficult even to give precise definitions for such things as 'computer' or 'software' or even 'British.' We have to settle for broad guidelines."

MinTech's memorandum to the committee states that single-tendered orders are given to ICL where the company satisfied 'requirement of price, performance and delivery.' "There are other cases where, for reasons of compatibility with existing systems or equipment, purchases are made by single tender."

Ted Leadbitter referred to the 'profound amount of secrecy' that surrounded Government procurement policy and criticized the present single-tender practice.

Maddock explained: "We would apply the same policy to Computer Technology Ltd if they could show that by fostering them a certain potent force would be offered in the British computer industry."

Reviewing the Ministry's support for British firms, Maddock notes that it is difficult to write down in precise words what a British company is. Foreign-owned firms manufacturing in Britain are often included. "We look not only at the companies but at the individual products of the companies."

The Ministry keeps in close contact with ICL in two ways, Maddock says. MinTech checks with ICL that the company's new range of computers is compatible with what the Government wants to buy.

There is also day-to-day contact on the general movement of computer technology.

Earlier, Maddock faced criticisms from chairman, Airey Neave, that the organization of Government departments connected with the computer industry presented "a pretty confused picture."

As Maddock describes it, the Civil Service Department is responsible for ordering computers for Government users and also for standards. Purchasing machinery, however, is managed by HMSO. A Technical Support Unit is located with MinTech and

is responsible for determining the programme of work in MinTech's computer research. It may also inspect and help with the installation of products.

Major direction of the Government's involvement in the computer industry is from two divisions within MinTech. The 70-strong Electronics and Computer division sponsors the manufacturers. A Systems and Automation division with a staff of 120, sponsors applications.

Apart from this, there are 'widespread committees' such as a CAD committee, which deal with various specialized topics. Between departments, contact is maintained

During examination of the MinTech representatives, figures were given of the last financial year's R and D cash support to the computer industry.

Research and Development aid to the industry.

	£ million
ICL .....	8
ACTP .....	2.8
Grant in Aid, NCC.....	2.2
CAD, Cambridge .....	2.1
APACE .....	0.4
SRC research projects.....	2.5
Extra MinTech projects.....	1.1
	19.2

by a number of inter-departmental committees, and a larger number of informal contacts.

The NCC plays a 'central role' in developing a view of the industry, and is the main adviser on standards. It reports its advice to MinTech. Eric Lubbock pointed out that this is unsatisfactory if the CSD is responsible for standards.

Maddock was careful to qualify what he meant by sponsorship. "We interpret it in a positive way. We go out and find the state of the industry, what help is needed and what can be done."

"In support of the computer industry, the Government has promoted rationalization, supported research and development, and pursued a policy of purchasing computers made in Britain when reasonably possible," the MinTech memorandum summarized.

MinTech's Advanced Computer Technology Project places contracts for work on promising developments with industry itself contributing half the costs. The aim of the project is to encourage more advanced developments in industry and reduce duplication of effort.

Lubbock criticized ACTP for concentrating too much on hardware. The latest figures for money spent in supporting ACTP projects reveals that £4½ million was spent on storage research, £650,000 on circuit technology, £200,000 on peripherals, and £700,000 on software.

Software manufacturers seeking support for worthwhile projects can go straight to MinTech. The amount of money available

for software support this year is about £½ million.

"Software flourishes in the context of its application. Now there is a large programme of CAD," said Maddock.

On the future of the British software industry, the Ministry's memorandum noted that: "There would be dangers if a very high proportion of the UK software industry were to fall to American ownership because so much of the nation's technological initiative in this sphere, and the talents that produce it, would be under foreign control."

"The main resource of the software industry is its brain power. What the industry needs above all else is the experience it can only derive from involvement in as many and varied applications as possible, and particularly in those which are large in scale, since it is from these that it will derive an international understanding."

Future trends discerned by MinTech are increased use of multi-access computers for rapid response information systems; incorporation of small computers into special purpose instruments; and the creation of data banks where information is retained for ready and immediate access.

MinTech foresees "a shortage of the highest quality systems designers and analysts and programmers for some years to come." But adds that "there is a substantial body of software expertise in the UK and a high general level of competence."

However, MinTech warns that Government support for the UK industry is no substitute for the achievement of sales on an international scale.

Maddock said that MinTech had given thought to the creation of a national system. "It is the task of the Ministry to lead in technology," he said, "but such a network ought to be co-ordinated by the Post Office." Neave said that Post Office witnesses had told the committee that NDPS did not want to perform such a task. "You'll need to persuade them," he said. "I try to do that all the time," Maddock replied.

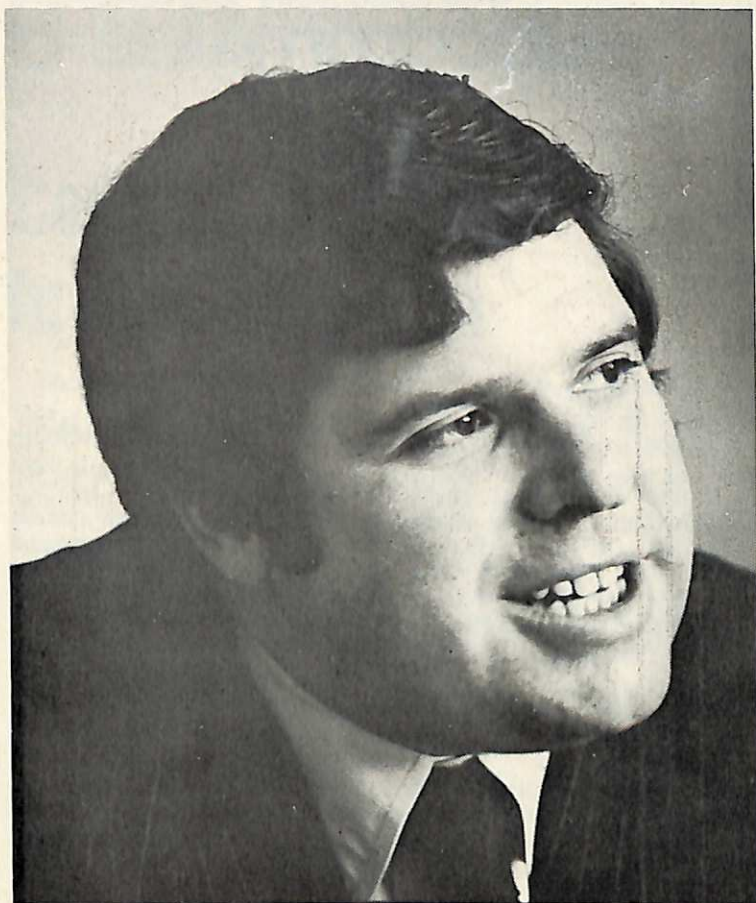
### Layman

MinTech's detailed and comprehensive memorandum to the committee contained an unusual feature...an annex devoted to a 'Layman's Guide to Computer Hardware and Software.'

Although it didn't begin with 'once upon a time,' the annex read rather like a journey through the computer fairyland. "Next we come to the specialist components..." "We next come to machine program of instruction..." "Next comes the all important sphere of applications software..." And so it went on.

To be fair, the overall impression was of a superbly efficient British civil service effort.





# Steinberg and Leasco

Leasco is a strategic magnificence. It was the first real computer leasing company. It was the first to solidify as the third-generation computers began to show signs of middle age. Then it was the first to *quit* leasing in the US. It was first into Europe. Finally, it was the only leasing company to establish a real foothold in time sharing.

Though it's the Hope diamond in the leasing treasure chest, Leasco has tactical flaws, tawdry facets, flashes of naïveté too. But Saul Steinberg comes through as a forthright and fairly fearless leader.

"WE WERE IN THE RIGHT PLACE at the right time with the right idea," says 30-year-old millionaire Saul Steinberg.

With an engaging open smile, he folds his hands together on the table top, then leans forward. "That was just luck."

He leans back again and knits his brow, burrowing for clear words to put Leasco's history in perspective.

"In the computer industry there's too much lip service paid to excellence, and too little real excellence."

Steinberg founded Leasco in 1961, partly with money borrowed from his family. He tends to gloss over the early years, and firmly disassociates himself from other leasing entrepreneurs.

As other leasing companies began to pop up in New York lofts, with various results, Leasco rose above the fray with its first public stock issue in August 1965. In 1966 Steinberg made the move which may have been a key to Leasco's eventual distinctiveness. He hired Booz-Allen consultant Michael Gibbs, who has been responsible for corporate planning ever since.

It is Gibbs who says, "While long-range planning is no substitute for budgeting, the planning process . . . disciplines us to analyze the viability of products or services in dynamic future markets. . . ."

When Leasco achieved this long-range planning capability in 1966, this was not the conventional way of doing business. (Gibbs points out it's not really commonplace even today.) "When I signed on, the corporate planning department consisted of myself, half of Saul's office, and (if I was lucky), ten per cent of his secretary's time."

The company has changed now. From a computer leasing business of 50 people in 1966, it's grown to be an international 'comprehensive computer services organization,' with consulting, container leasing and insurance subsidiaries, more than 9,000 employees, and annual revenues approaching half a billion dollars. The corporate planning department has meanwhile expanded from 1.1 people to a staff of six in New York and two in London.

Planning, in Leasco terminology, has been evident primarily in acquisition, though Steinberg points to international expansion and time sharing as examples of planned internal growth.

The long-range master plan was carefully devised and meticulously observed, which allowed most of the acquisitions themselves to take place over a fairly short period. The Steinberg-Gibbs action program included: (1) computer technology

acquisitions (information systems, systems software, simulation, and applications programming); (2) services (bureau, time sharing, specialized information products, and databanks); (3) use of existing resources (marketing and computer inventory); and (4) expanding the financial resources. Leasco—itsself a 'capital consumer'—needed to find a 'capital generator.'

In 1966 the first acquisitions, Documentation Inc and Fox Computer Services, were blended together to form Leasco Systems and Research. Steinberg admits, "We wasted a lot of time trying to orient this towards commercial business, even though it was essentially doing government work. But our experience eventually taught us that by putting a software group into Werner, for example, we can serve the textile industry better than by having an 800-man software company."

The big acquisition drive really gained momentum in September 1968, with the merger with a 'capital generator,' Reliance Insurance Company. Easier targets were Operations Research Inc, which brought big systems capability, and Information Development Corp, for operating systems and compilers.

The straight consulting companies, mostly 1968 acquisitions, do around \$35 million. Like the corporation itself, these are structured with industry-specific orientation in the States, while Inbucon in London is a general consultancy which cuts across all lines of industry.

The other consultancies are Werner (which specializes in the textile industry), Berger (with engineering, plus architectural and economic development), CPM (which does most of its work for refineries and other process companies), and the newest member of the clan, Yankelovich (which specializes in market research and attitude surveys, including the Fortune 500 survey).

While other leasing companies were writing one-year leases, Leasco stayed with four and five-year terms. Smaller machines and peripherals came into leasing vogue, and still Leasco remained faithful to the largest 360s. "That's not to say we didn't have self-doubt," Steinberg asserts. "But history will show we were essentially right."

"Then we went through a period when we went from \$100 million to \$500 million in 18 months. That requires a different kind of management, and different kinds of skills."

Leasco's net after-tax earnings for the last fiscal year were just under \$44 million. Of this Steinberg comments that about \$30 million comes from insurance (of which \$17 or \$18 million is regular insurance operations and \$12 million is capital gains



from the investment portfolio). The rest comes from the computer business. About  $\frac{2}{3}$  of the remainder is from leasing, and  $\frac{1}{3}$  from software and consulting . . . and still this amounts to about \$4 or \$5 million. The company has \$1.2 billion in assets, and cash of about \$120 million.

The chairman adds a comment about the international scene. "Leasco has \$350 invested in 360 equipment. Our planning allows us to take still more equipment in Europe. We have put a lot of money into Europe (\$50 million is budgeted this year) but we need local financing to leverage it. In the first half of this year, for example, we have put \$16 million in equity capital into the UK to finance hardware purchase.

### Elliptical orbit

Time-sharing began to play a large part in the company's plans as the leasing industry matured, and Leasco S&R in Maryland began to develop a time-sharing system based on the Hewlett-Packard 2116 computer, while Leasco S&R people in London started to look at Modular One for Europe. Then a \$40 million preliminary order for XDS Sigmas was announced.

As Leasco entered fiscal 1969, it concentrated more on "building from within," especially after the bruises the corporate ego suffered in conjunction with SEMA/Metra and Pergamon courtships. As Gibbs says gracefully, "The critical mass was there; it was time to maximize its profitability."

This entailed a "critical self-appraisal" of Leasco's resources, and resulted in the acquisition of one Frank McCracken, a 23-year IBM veteran, as president. He brought in a few key men and immediately put a stop to the plans for a Sigma-based time-sharing network. Instead, he turned Steinberg's attention to the benefits of using partially or wholly depreciated hardware for time-sharing.

Now 19 systems are working in the US. By the end of September, Steinberg expects to have 39 systems working, and the 1971 fiscal year, which begins then, should present time-sharing profits "in the millions".

Steinberg continues: "After Frank came we took Call 360 for the 360/50 and are modifying it slightly for the /65. We get about a three or four times power increase, and the speed is unbelievable. We've been up and running on Call 360 (only we call it Response 360) since April 2 in Bethesda, with no trouble. We couldn't get a 360 back from lease, even though we offered to pay users a certain number of months' rent. So we went out and bought one for the new service. If I had this to do over, I would have gone with Call 360 only, and I would have spent every nickel I had in application programs and marketing.

### Critical mass

Each Leasco branch in the US is charged with creating (probably for specific customer needs) at least one industry-oriented program per month. Of the 10 to 14 that are submitted, the best is chosen for full treatment, with a product manager, documentation, training for Leasco marketing people. "Within three to five months," says Steinberg, "it has been disseminated to all the field offices. After a year of this, we will have programs for every industry we want to do business with."

These industries are: printing and publishing; public utilities; food and merchandize distribution; manufacturing (not metals, autos, or aerospace); textiles, federal, state and local government; education; and banking and finance.

"We are not edicting to the European groups that they follow our industry strategy. In the US we are not accepting business outside these industries. Here in London they are accepting

business so long as they can perform it well. For example, they specialize here in real-time and information retrieval, largely because of Peter Hunt and his people's experience."

Steinberg tends to view companies or people in the framework of the Leasco master plan. Neither "disacquisition" nor "executive mobility" causes him undue ulcers.

"Every operation must be profitable. We had or maintained for a year or so certain companies that operated at a loss or break-even and made no other contribution. We have closed Nordisk in Germany now, but kept the key services of Nordisk in Sweden.

"There was a very short period when we wanted to get a closer look at hardware, so we invested in some hardware companies." Steinberg says Leasco has a minority interest in Dethloff in Germany, and "a piece" (around 10 per cent) of Data 100 in the US.

"We are not interested in the long run in holding 20 per cent of various companies. We prefer a 100 per cent or at least a 51 per cent position.

"In any event, all our consulting groups are managed on a fairly autonomous basis. For example, they don't have to use the facilities of the Leasco software operations. We encourage them to do so, but their decisions are independent. Similarly, we encourage them to joint bid, but they are free to pursue their own directions."

### Staffing policies

On the staff side, Steinberg is equally candid. "Our philosophy now is to build from within as much as possible. We have passed the balance point, where we used to bring in more than half our key executives from outside. Last year the promotion vs hire ratio was about 50-50. This year it's about 75-25, and we hope to hit 90-10 next year, especially at the executive level.

"We make a conscious effort to overpay. Unless we create a tough-minded atmosphere where the best people have a chance to move, then I think we have failed in our obligation to our people.

"I think the company has a responsibility to the employee. He should be promoted every time he succeeds. He should be given the opportunity to fail at the next level. If he does, then he's either asked to leave the company or put back to where he was a success.

"I'm never concerned about turnover rates. But it's important to watch where the turnover is. We rate every employee A, B, C, or D according to performance. If the trend is in the A group, then I'm concerned.

"You have to get rid of the worst 10 per cent to create room for good people to be promoted and enhance their positions with the company.

"Certainly, there's no higher risk (in going to work for Leasco) for good people. Our turnover of top people in the company has been virtually nil, in an industry where top turnover is considerable as a norm. Most of the top people who have left Leasco have been 'helped' to make that decision.

"We are creating an atmosphere of open-ended opportunity for good people. People who are consistently poor performers have no place in the company. We are in business to make money. We must have customer satisfaction. Poor people detract from customer satisfaction, and if you don't get customer satisfaction, you won't make money."

Steinberg leans forward and says firmly: "We can win this game, if we just stay disciplined. That's the key to our strategy."





# Predictors clash at Data Decade

"We are talking about an industry capable of growing by a factor of ten—one which has as its competitors some of the toughest, hardest companies in the world: the computer manufacturers." This Dick Brandon remark serves well as a peg for Data Decade, the conference assembled in London last week to listen to an array of distinguished speakers talk about the computer service industry, and its prospects for the next ten years.

Appropos of conferences, the joke at the Bloomsbury Centre Hotel was: 'If any business is growing faster than computing, it has to be the conference business.'

Perhaps the basic function of these events is to reassure. There can be no other explanation for the presence of some of the familiar faces (without naming any individuals) in the audience, who might have been expected to have at least as clear an idea about the computer service in the seventies as any of the speakers.

One has to conclude that it makes DP people feel good to be among their equals, and to listen to their equals making optimistic noises about the future. The great moment was the first public unveiling of Saul Steinberg. Here, for all to see in the flesh, was one of the ultimate success stories of this industry... and he was received rapturously, not for the content of his address, but because he is the visible symbol of the industry's dynamism and money-making potential. Maybe just being around him made everyone feel a little closer to the proverbial crock of gold.

## Tripartite industry

Dick Brandon's basic theme was that the computer service industry is divisible into three segments—people-based, machine-based and product-based.

People-based services, he claimed, were consultancy, programming, and system design and engineering.

Programming he described as 'a business which is only marginally profitable', and always subject to severe problems of cost control. Systems design and engineering had been opened up by IBM's unbundling, but though there would undoubtedly be big contracts in the offing, there was one major problem—that all the computer manufacturers were potential competitors in this area.

The machine-based services he described as bureau operations, time-sharing, and facilities management. Bureau operations were highly competitive, and not highly profitable. Specialization is the key to the future of bureau operations.

Time-sharing was dismissed pretty quickly by Brandon as having no economic viability. Facilities management? 'Not a long-term business.' Some users will debate the responsibility of installation management, but it won't last—it isn't good business sense for the user.

The product-based sector he identified as education, publications, and proprietary

software packages. Training and publications activities he described as highly subject to the prevailing business climate: they are the first areas to be cut back in any recession. Software packages have 'a very big future—a lot of economic justification,' though Brandon added that a lot of customer training was required to sell them.

Turning to straight predictions—always Brandon's chance to be provocative (perhaps in the sound knowledge that no one in ten years' time is going to bother to refer him back), he says there are around 2,600 companies in the computer services field in the States, of whom maybe 15 are turning over more than \$5m, with a further 200 grossing over \$1m. In this decade, he adds, the smaller companies will go to the wall. By 1980 we may see five or ten companies earning more than \$250m, between 30 and 50 more than \$50m, and perhaps a hundred small companies. The remainder will be merged, go broke, or (the alternative in the States, says Investor Dick) go public.

## Figure comparisons

John Hoskyns ("I predict a decade of sustained and vigorous growth for IMB's legal department") began with the shots in the dark. It is interesting to compare them with Brandon's, where possible.

Hoskyns' UK figures:	1970	1980
Consultancy	£3.8m	£10.5m
Software	£6.4m	£126m
Bureaux	£40m	£483m

His world estimates:

United Kingdom	£49m	£619m
Europe	£243m	£3,097m
United States	£1,426m	£12,750m

Now Brandon is not regarded as a particularly conservative commentator (though some of the predictions made back in 1962 look pretty conservative today); contrast his predictions:

United States:	1970 estimates	1980
Consultancy	\$220m	\$500m
Programming	\$350m	\$1,500m
Systems Design	\$350m	\$3,000m
Bureaux	\$600m	\$4,000m
Time-Sharing	\$150m	\$500m
Facilities Management	\$250m	\$1,000m
Education, Publications	\$200m	\$800m
Software Packages	\$125m	\$2,000m
Other Computer Services	maybe \$1,500m	

On the 1980 estimates, Hoskyns' figures for the United States is just about twice Brandon's—a cool six thousand million pounds away. And when Brandon dismisses time-sharing—how bad is \$500m?

After Hoskyns, Ken Barnes of SPL. He began with as dramatic a set of figures as any that had gone before. The total UK expenditure on information processing, he says, represents 30 per cent of the gross national product. Expenditure on computing amounts to 2½ per cent of the GNP—and half of that was systems and programming development.

Somewhere around 160 companies are involved in the software and consultancy

business, says Barnes. Between them they represent a total work force of maybe 3,500 specialist staff who are commercially available to the market—and 1,000 of them are working for only four or five companies.

Barnes then drew his by-now familiar picture of the development of the software business. In the beginning there were computer manufacturers, and their market depended on them for support. Then the market realised that the key to successful data processing was utilization, not hardware... and, Lo! there was a savage fight for competent staff, most of whom were working for the manufacturers.

And so there came to be software houses.

The large contracts theme was taken up by Peter Clarke of IBM. He was the first speaker to state the obvious—computer services is a people business; the development of what he called the advanced Management Information and Control Systems of the next decade is going to need some very high-calibre people, and, he added, the only way to get the right experience to handle these projects is to work on them. His warning—that there is simply not enough advanced projects around to develop the leadership that the service industry is going to need—was right on the button.

In a closely argued analysis of the future of the service sector, he defined five probable directions:

1. Service industries, such as banks, will go into data processing services as an adjunct to their own activities.
2. Some companies with a need for comprehensive internal data processing, but who feel that it will be difficult to absorb, will set up DP subsidiaries—who will exploit the market with their spare capacity.
3. Groups of small companies will form joint service subsidiaries.
4. A number of companies will prefer to get their own machines, and will look to external sources for support.
5. An ever-growing number of companies will come to regard DP as they regard electricity: they will look for computer power as a utility.

The service industry will find its market in the last two categories, said Clarke: implementation support will be "the area of greatest growth in the service industry;" a growing number of users will sub-contract the whole management of their installations.

Steinberg began by throwing out some good news. A recent study in the States of the problems and attitudes of 400 DP managers and executives had come up with the following findings: 83 per cent of those interviewed needed outside help in upgrading their staff's technical knowledge; 49 per cent had no documented plan for development of their installations during the next few years; half those who did have a plan hadn't had it approved by their management; two-thirds had personnel problems; and (this made the audience lick their chops) 72 per cent planned to use outside service companies to help solve their problems.

Steinberg's vision of computing is a



sophisticated one; services will be provided on an industry-wide scale by companies offering industry-oriented software and personnel with industry-specialised skills. The name of the game is the centralised control system—the all-swinging and dancing shop floor-to-MDs-desk-type-system. Will it really happen that way? Perhaps, but Clarke's remarks about the no projects—no people—no leadership are worth bearing in mind—and he was talking in the UK. The level of personnel in the States is, if anything, worse.

ICL's Peter Hall contributed a down-to-earth look at some realities, pointing out that the poor manufacturer usually gets the blame for computer problems.

Hall outlined ICL's new diversification scheme, which will be detailed later.



"I'm afraid we'll need more than the ears to reach a computerized decision!"

## Mintech Contribution

FOR THE SECOND TIME in one day—the first was at Subcommittee D—representatives of MinTech stated their case on the computer industry. Different stars, different venue—different story?

Taking the stand for the last half-hour of the formal session on behalf of MinTech were John Nicholls, head of the Systems and Automation division, and Lawrence Zyman from the upper hierarchy of the IRC (that child of the Government responsible for shuffling the commercial pack and dealing companies to the mutual benefit of one and all.)

Nicholls said that any ideas MinTech might have towards the software industry were purely of a formative nature. He was really 'thinking aloud.'

He pointed out the software and services side of the industry was only recognized as a separate entity as recently as last year.

At this time hardware interests were passed over to the old electronics division, and software and services collected under the systems and automation division.

Whilst the Government recognizes no fixed definition of the software industry, said Nicholls, he ventured his own interpretation: "Take away mainframe and services and you are left with software."

He recognized three areas of activity, software houses, bureaux, and consultancies. With some companies operating in two or more spheres, the 350 companies in the field fell into one of seven groups.

Nicholls pre-empted the IRC speaker by anticipating a regrouping of the software and consultancy activities under one roof giving rise to 'systems architects.' Whilst his division had no sponsorship responsibilities, its 'thoroughly objective advice' will be aimed in this direction, he added.

For the IRC, Zyman said its interest is engendered by a realization of "the rapid growth of the software industry. We realize that, in the future, software will represent a substantial proportion of the industry." IRC's particular interest, he said, is in the impact of computer applications on manage-

ment, and the competence of the management of the software industry.

Zyman was at pains to state what IRC was not going to do. It has no blueprint of the software industry. It plans no secret mergers and is not convinced that mergers will be of any use.

He envisaged, also, the formation of the systems architect, but added, "There will always be room for the small, specialist company." One characteristic of the systems architecture house will be a strong marketing capability.

On the finance side IRC has 'been known to provide finance in a merger situation' and can provide finance at other times. It prefers to be thought of as a 'lender of last resort.' But he anticipates that IRC will be making an announcement of its first investment in the software industry within the next seven days.

Ken Barnes reminded us earlier that if a June election is called, the works of Subcommittee D will be in vain. The speed with which the MinTech speakers got through their scripts might lead one to believe their faith in the opinion polls is not exactly absolute.

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MDS introduce a remarkable new system to provide the fastest, most economical keyboard-to-magnetic tape data processing for multiple format applications.

The system combines up to thirty-two keyboard units, a dual multiplexer and up to fourteen tape handlers.

The dual multiplexer ensures continued system function in the event of a single hardware failure. All keyboards can continue to operate with some reduction of throughput, but as many as sixteen can continue to operate at full speed.

Core storage for 40 format programs is provided. Program changes are simple and can be done without affecting system operation.

The multiplexer accepts data from keyboard units, checks it and releases it for transfer to tape.

Multiple tape units make it possible to assign any keyboard station to any tape unit. Thus different applications can be allocated to different units and be processed in parallel.

## **The new MDS 9200 system provides multiple data recorder capability plus central control**

This new MDS magnetic tape processing system centralises or 'pools' data input giving increased flexibility

plus central control advantages.

The 9200 system combines up to thirty-two Data Recorders cable connected through a central multiplexer to up to fourteen tape units.

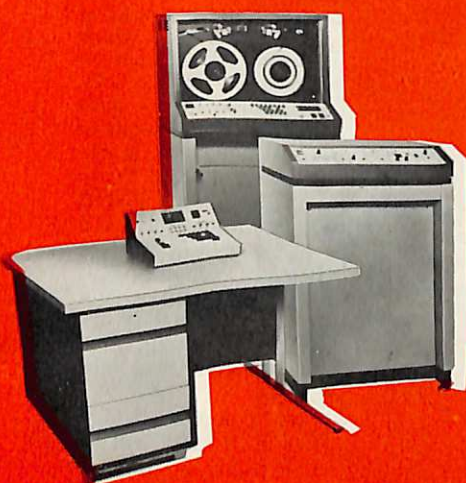
Multiple tape units make it possible to assign any Data Recorder to any tape unit. Thus different applications can be allocated to different units and be processed in parallel.

The 9200 system provides all standard Data Recorder functions plus off-line peripheral capabilities including data communications.

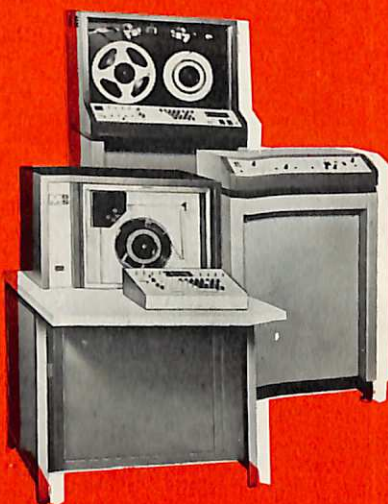
Data Recorders can still be used individually where central operation holds no advantage. Individual units can be switched 'on-line' and 'off-line' easily and quickly.



# MDS introduce 3 great new systems in the '70s



9000



9200



7500

**The new MDS 7500 low cost high performance off-line data conversion system frees computers from slow on-line operations**

The 7500 system provides a selection of data handling media. The maximum system configuration consists of Controller, Magnetic Tape Handler, Card Punch, Card Reader, Line Printer, Paper Tape Punch and Paper Tape Reader. A minimum system consists of Magnetic Tape Handler, Controller plus just two of the other units. The communications interface is optional.

The system operates through the Controller which accepts data from one input source. The Controller

passes this to a selected output unit to produce either a printout, magnetic tape records, punched cards, paper tape or transmitted data.

The system allows one unit for data input and one or two for data output. The Magnetic Tape Handler can function as one of the output units when not in use for input purposes.

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See the new MDS 7500 System on Stand No. E 717 at the International Instruments, Electronics and Automation Exhibition at Olympia from 11th-16th May.

The MDS 9000 and 9200 Systems are being demonstrated at the Westbury Hotel, Mount Vernon Room, New Bond Street, W.1. on Friday, 15th May. You are cordially invited.

# MDS



# Britain's computer company launches Britain's software house?



It would be tempting to headline this article "ICL Unbundles," but this would not be strictly correct. Not yet, anyway.

However, if there were any anticipatory move ICL could make towards unbundling, a separate software house would have to be it.

Announcing the formation of "Dataskil," as a wholly owned subsidiary of the ICL group, enjoying the same status as Dataset, DRI and ICSL, the parent company has effectively formed one of Britain's largest software houses.

ICL last week floated Dataskil on authorized share capital of £50,000, and budgeted turnover for the first year will be "in excess of £1½ million." The new company will undertake contract systems and programming work, contract operating and management of computer equipment and associated facilities, and contract consultancy in all these fields. Dataskil's executives, and the majority of its staff, will be drawn from several of ICL's existing organizations. Chairman of the new company will be Mr Peter Dudley Hall, who is at present the director responsible for software, customer engineering, services and personnel, education, and training, a broad enough brief. His deputy will be Dennis Blackwell, at present manager of the systems and programming organization. Much of the work of this department (SAPO for short) will be taken over by Dataskil, and will constitute one of its main strengths. Alan Rousell who will be Dataskil's managing director, comes from ICL's information and programming services division. Particular strength will come from operations research and engineering consultancy, with resources filched from ICSL, which will revert to being more simply a service bureau.

The new company aims to provide a complete software line ranging from individual services to 'turnkey' operations, but Dataskil will place emphasis on what it considers to be its particular skills. Hall says the company intends to develop good relations with other respected software houses, and, if necessary, to sub-contract work to companies with particular specialities. Dataskil hopes thereby to assist the development of the software business generally, and to be able to offer a comprehensive service.

## A leg up on Project 52?

These customers would at first be exclusively ICL hardware users—Dataskil hopes to avoid charges of forcing any issues by offering a genuinely competitive service. The new software organization offers the added advantages of being able to offer services based on unannounced release of equipment from the parent company.

*From top, Dennis Blackwell, deputy chairman; below Peter Dudley Hall, chairman; bottom left, Alan Rousell, managing director.*

The Dataskil executives emphasise that the formation of the new company will make no difference to the charges paid by customers for existing services, and that only those services are being taken over for which customers were already being charged separately. Existing "bundled" software will continue to be provided and maintained by ICL's SAPO, and "less than one quarter" of the staff of this organization will be transferred to Dataskil. Indeed, ICL anticipates that Dataskil can itself offer special skills to the parent in certain fields; these might reappear as bundled services.

Dataskil at first intends to confine its marketing operations to the UK and will do so through the existing ICL sales organization, says Hall. Definite plans for overseas expansion will be announced soon.

Computer expenditure in the UK was at present running at £500 million of which £175 million (35 per cent) is devoted to hardware; £206 million (41 per cent) to software and services; £38 million (8 per cent) to bureaux; and £81 million (16 per cent) to other categories. Because this sum is expected to expand to a total market figure of £2,000 million, with a corresponding shift in the percentage breakdowns (involving a greater emphasis on software and support services than on hardware supply), ICL decided to take positive steps to make sure it was ready for the shift. Dataskil is the result. Hall denied a questioners suggestion, however, that by 1980 ICL might be a subsidiary of Dataskil!

Head office of the new company, which comes into being on the 7th of May, will be at Reading. Additional production centres will be located at London, Kidsgrove and Edinburgh. The planned staff of 250 systems analysts and programmers will be distributed amongst these centres.

## Distinguished Fellows

A new class of members, "distinguished fellows," will be created if proposed changes to the BCS's articles of association are accepted. The new accolade will be reserved for those who have "rendered outstanding service to the profession."

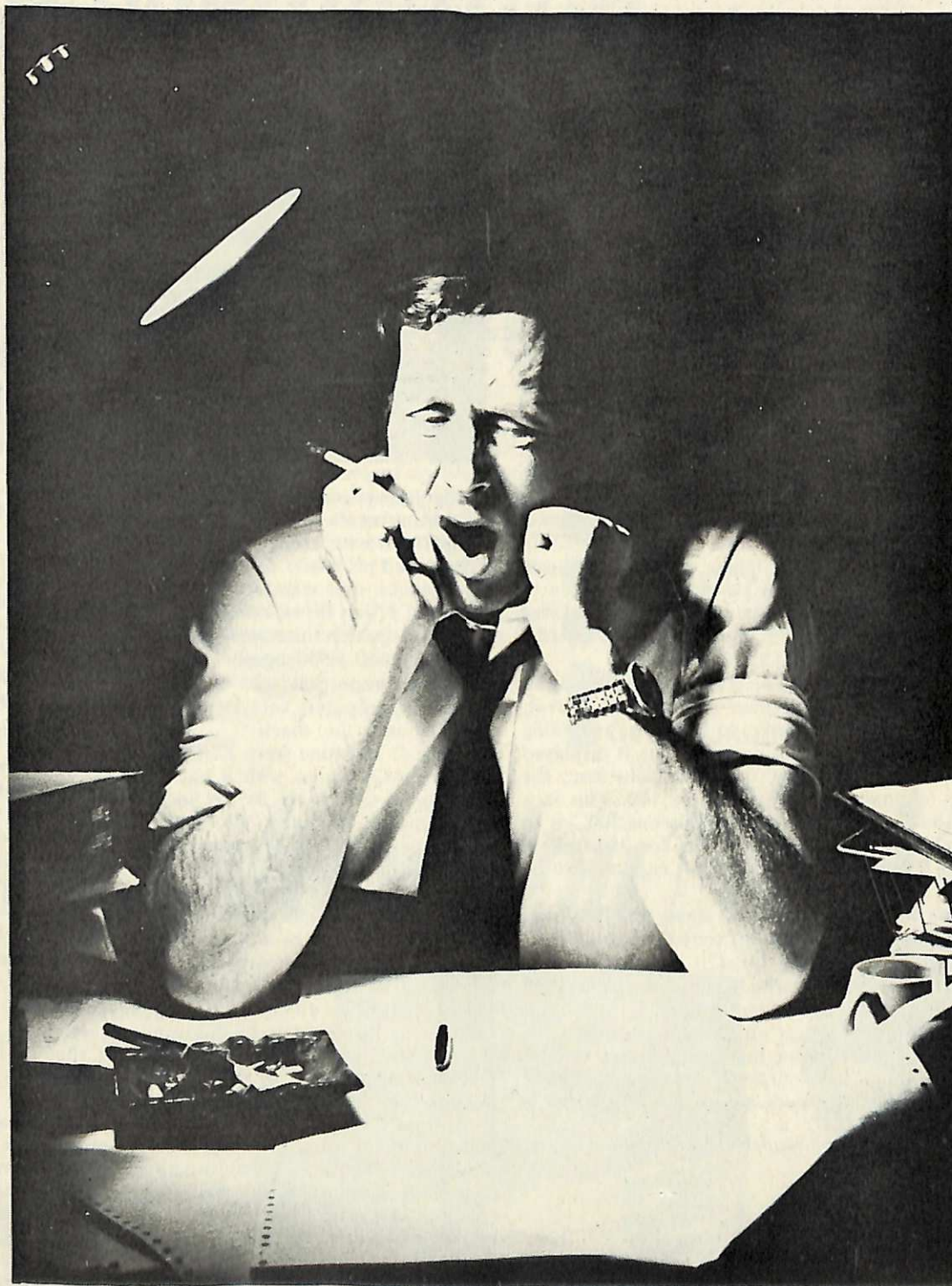
An individual will become a distinguished or honorary fellow only if three-quarters of the BCS council attended by at least two-thirds of its members vote in favour.

In addition, the proposed new articles suggest that "the council may in its absolute discretion and without assigning any reason therefore admit any person to any membership of the society."

The society says this blanket resolution is intended to cover "Distinguished Americans" who cannot get sponsors in their own country. It also covers new methods of entry for over-age candidates, business men and academics.



# Computers should work round the clock, people shouldn't.



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Writing a program for example. It may take you weeks. And then when it comes to testing it, all your computer will do is sit there, blandly pumping out ream after ream of largely useless information. Leaving you to sift through it for possible errors.

But with Hoskyns Linkmaster, you can help your 360 to help itself. You can program a computer in the most efficient way. Modular programming, using Assembler.

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And start getting home before your dinner's cold.

 **hoskyns systems research**



# Minicomputers triumph at maxifair

GERMANY'S TRADE JAMBOREE AT HANOVER was bigger and better than ever this year. The organizers claim that with more than 5,500 exhibitors from 25 countries renting around 5.5 million square feet of stand space, it is the largest trade fair in the world. Nobody could possibly doubt them.

It had something to offer for everyone—not least the computer man. In the newly built Centre for Office and Data Technology—a vast, cavernous shed 559,384 square feet in size—sat all the world's big names in the computer industry. The special section devoted to data technology, data processing and office machinery had 270 direct exhibitors plus 130 represented companies.

As befits the market leader (with some 60 per cent of German computer sales), IBM had the largest stand. Swarming with hyper-efficient American-German salesmen, replete with crew cuts, dark suits and white shirts, its main attractions were a System 3 linked with a 360/40; a new optical reader, the 1217; and the new 2750, voice and data switching system. Introduced last autumn to cope with the rapidly developing technique of teleprocessing, the latter equipment has not yet been marketed in Britain because of difficulties with the PO. But an internal installation is already in use at IBM's Havant plant.

The other big American manufacturers were all showing at the Fair, represented by their German subsidiaries. Univac, which claims second place in the market to IBM, was exhibiting for the twentieth year. Amongst the new products it displayed were the 1557/58, a graphic display unit with light pen; the DCT-500 teletype terminal, and the Uniscope 100. This is a cheaper and more advanced version of the Uniscope 300, yet to be seen in Britain. Univac already has orders for 250 from a large warehouse in Hamburg and on this basis expects it to be a big success.

The theme of the Bull-General Electric stand was 'information by integration.' Amongst the exhibits were the small GE-53 direct processing system and the GE-120 small-to-medium system, linked to the GE-600 in Paris. In addition the GE-120 was shown in Germany for the first time.

Outstanding even among Hanover's many new products were two small, low-cost computers—one, the card and tape version of the Bull-GE-58, comes from France; the other, ZUSE's 16-bit z 43, is from Germany. Both are expected to make a

*A card-oriented version of the Bull-GE 58 has been introduced at the Hanover Fair.*



strong impression on the lower end of the European market, the former at the expense of IBM's System 3, and the latter in competition with Honeywell's DDP series.

Designed primarily for newcomers to computing, the GE-58's card version uses standard 80-column cards and rents for £520 a month. It can be extended with the MFTU-50 multi-function tape unit, which increases the speed of file handling to the equivalent of 1,500 cpm. The 58's original disk version has played an important role in helping to double the number of Series 50 computers sold in the past 12 months, and in getting Bull-GE into the black.

The z 43 machine from ZUSE (a wholly owned subsidiary of Siemens AG) comes with a basic 8K-byte CPU which can be built up to 64K bytes by 8K increments. Each of these increments cost £1,700 extra, and the price of a basic configuration with paper tape I/O and printer is £11,000. Software available includes Fortran 4 and Cobol compilers, Basic and tape and disk operating systems. Both desk-top and rack-mounted versions of this machine are offered. It also has a dual use—as an office computer, or as a remote processing terminal.

Of the really small computers none were more impressive than those of the home-grown company, Nixdorf. Founded by Heinz Nixdorf in 1952, it has rocketed to success in Germany, gaining the largest slice of the mini-market.

Its growth can be judged by the fact that in 1952 Nixdorf had four employees: in 1970 there are 3,500 in Germany and another 600 in overseas subsidiaries.

In June Nixdorf plans to set-up shop in Britain where its wide range of machines and the peripherals so prominently displayed at Hanover should make a noticeable impact.

Though Nixdorf is the fastest growing German computer company, Siemens is the biggest, with about 15 per cent of the market. With characteristic Teutonic thoroughness, the Siemens stand was designed by computer. A Zuse graphic display unit coupled to a 4004 machine was used, with most impressive effect. On the company's stand were examples of both large and small systems.

Nonetheless, Siemens' most interesting exhibit was a new 4004 Model 46 time-sharing system. This can accommodate 48 users simultaneously and offers both batch and conversational operation. With the introduction of this system Siemens clearly hopes to carve itself a meaty slice of the rapidly growing German time-sharing market. Other companies have the same idea and thus for the first time, time-sharing was the biggest topic of discussion at the Fair. If the computer section had a theme this was it.

Other systems on display included the new Philips P-9200 with Olivetti terminals. The Dutch giant was also using one of its small P-250 computers as a very intelligent terminal. And another of its exhibits was the big P-1000, a competitor to the IBM 360, not currently available in Britain.

BRIAN PITTS



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*Sam Wyly, UCC's 35-year-old chairman—"the computer industry can be a greater international force than foreign aid."*

## Wyly keynotes SJCC

UCC'S Sam Wyly addressed the opening session of the Spring Joint Computer Conference in Atlantic City's Convention Hall (May 5) on the theme of "Computing, Communications and World Business".

Wyly sees instant computer power created in every corner of the world by the marriage of computers and communication. He predicts a revolutionary change in today's concepts of production, distribution and business services due to this sudden availability of computing power.

Some 45,000 visitors are attending this year's conference, held once again in Jersey's equivalent of Brighton. Telephonic chaos during the show bears out Wyly's predictions, but for the time being it's more like divorce than marriage of computers and communication.

Meanwhile back at AFIPS headquarters, the sponsoring organization's president Dick Tanaka announced (to immense industry relief) that future Joint Computer Conferences will be held to 1,000 exhibits.

*In Dallas to receive his award as UCC's International Employee of the Year, John Kason (centre), director of UCC Computer Centre, London, is personally congratulated by Sam Wyly (left), chairman and founder of University Computing Company and Charles Wyly, Jr, President of the Company.*



**datascene**

## Five 1906A's for Universities

Belying the rumour that Oxford was getting five 1906A's, ICL just announced that each of five British universities is getting one ICL 1906A computer system. Each installation is valued at around one million pounds.

The universities are Oxford, Manchester, Leeds, Nottingham and Birmingham, all of whom are currently using ICL machines.

The 1906As will provide the five universities with batch processing, remote batch processing and interactive multi-access facilities. Thus ICL says the University Computing Centres will be able to offer a more comprehensive service to their users than is currently possible.

### Oxford University

In September this year Oxford University plans to take delivery of the first 1906A to come off the production line.

### University of Manchester Regional Computing Centre

For many years the University of Manchester has been using an Atlas 1 computer. The computing capacity has recently been extended with the installation of an ICL 1905F, and the 1906A computer will provide a further increase in the facilities available to the Regional Computer Centre.

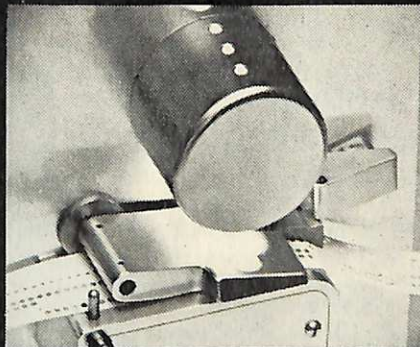
### Birmingham and Nottingham Universities

Nottingham is due to take delivery of its 1906A in early 1971, with Birmingham following about a year later. These machines will be part of a proposed Midlands Universities Regional Network.

### Leeds University

The Leeds machine is due for delivery early next year. As the largest machine in Yorkshire this 1906A could well provide the focus for a Yorkshire Universities computer network.

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# Swedish railways reserved

Using an IBM 360/40 and a communications processing unit IBM 3968, Sweden's State Railroads have inaugurated a new seat reservation system. Twenty reservation terminals are to be located in major towns and these will be linked to the central computer.

In the railway station the clerk registers the customer's order on the reservation terminal. The message transmits over the internal teleprocessing network to the communications unit checking the accuracy of the transfer and the message goes into the cpu.

Here a large number of registers are searched to find the best seat for the customer. The ticket is prepared and automatically printed by the terminal in the station.

To increase accessibility and service rate the new system offers access to a second communications unit and an IBM 360/50, which is normally used for administrative purposes.

Swedish State Railroads may have the lead on this computerized reservation system, but it is not unique. Penn Central in the States have committed the Metro liner service running from New York to Washington, to a computerized ticket reservation system based on Ticket Reservation Systems. Apparently three other East Coast railroads are talking about an interline reservation system, and the American Government is showing considerable interest in the schemes.

Nearer home, British Rail has said nothing about the subject. However, since British Rail is running Music Line—a package rail and theatre ticket scheme making use of Seat Reservation Systems computer and terminal—it is more than likely that they are doing a lot of thinking about computerized ticket reservations.

## All-time record sales

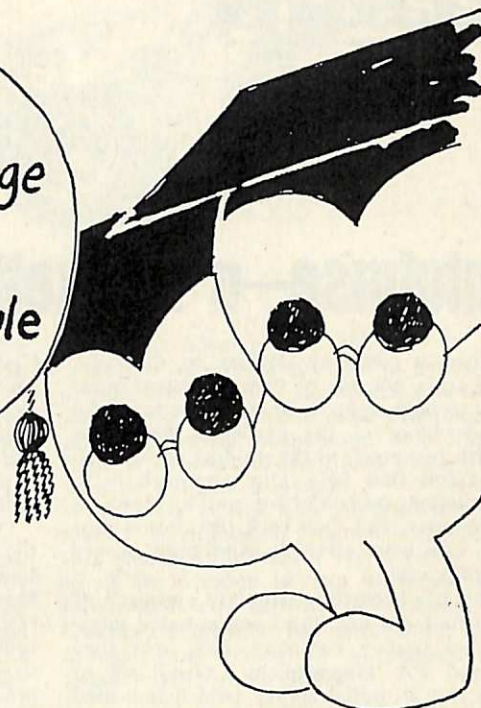
Honeywell has announced its world-wide sales and earnings for the first quarter of 1970—an all-time record—£152 million. The figure represents a 12 per cent increase over the first quarter of 1969, with a 17 per cent increase on earnings alone.

Board chairman of the automation company, James Binger, revealed that sales increased in all areas except aerospace and defence equipment, where US Government policy changes caused a levelling off in orders.

Computer and communications orders, shipments and revenues are "well ahead of a year ago, and all computer divisions show record backlogs," he says.

Sales of automation systems and controls for industry increased. "We continue to be modestly optimistic about the year in view of the anticipated increases in capital spending by industry, particularly outside the United States, where new orders and shipments are substantially ahead of last year."

Ahem! Ahem!  
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training courses.  
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for May to  
August.



Course	Code	Fee	May	June	July	Aug.
Computer Appreciation		£				
Senior Management	A1	45	21-22	25-26	30-31	—
Middle Management	A2	40	14-15	22-23	27-28	—
Clerical & Non-Technical Staff	A3	18	—	2	3	4
Practical Systems Analysis						
Module 1— Introduction to Computers	S1	75	—	—	6-10	—
Module 2— Main Course (Residential)	S2	225	—	—	13-24	—
Basic (ASA) Fortran	P1	60	—	29-	-3	—
Extended Fortran (CDC 6600)	P2	25	—	4-5	28-29	—
Cobol	P3					
Module 1— Introduction to Programming		15	—	8	—	—
Module 2— Main Course		110	—	9-19	—	—
Basic Linear Programming	P4	80	—	8-11	—	—
Advanced Mathematical Programming	P5	80	—	15-18	—	—
Traffic Flow Analysis	P6	25	28-29	—	—	—
Short-Term Forecasting— Chronos Program Suite	P8	35	19-21	—	—	—

You're welcome to cut it out and keep it for reference or, better still, write or 'phone for the brochure giving fuller particulars, to Eric Duke, Education Manager, SIA Limited, 23 Lower Belgrave Street, London, S.W.1.  
(Telephone: 01-730 4544)





# Database—a marketing exercise

When a company decides to diversify, there are a number of very important questions to be answered. These range from the broad choice of the particular field with growth prospects, to the product with which to exploit that field. One approach is to commission an objective survey from a consultancy, and then back the chosen product with what all such ideas need, plenty of ready cash.

This has been the exemplary approach of William Jacks Ltd, the London-based international trading company. Last year they engaged PA Management Consultants to carry out an initial survey (which indicated computing as a real growth field) and follow it up with a particular product suggestion. This plumped for the small computer market, rather than peripherals, which might involve too close ties to OEM manufacturers.

The next step was to isolate a 'best-buy' among the small computers. This part of the survey was entrusted to Hayes Norman Bell. The firm carried out a comparative study of about 20 small computer manufacturers, whose products were on the market in the States but not in this country. From this, the Clary Datacomp 404 emerged as a leader, in several respects, so marketing and possible manufacturing agreements were negotiated with the California company.

The scene was therefore set for the launching of Database last summer. The picture since then has been of a slow but steady build-up, with a few systems sold as test installations.

Within the company the main emphasis has been on software development. In addition to the 404's native assembler language

Clary is developing a Cobol compiler, which should enhance 404 saleability. The crazy result will be pushed in a big way at Computer 70 next autumn, but in the meantime Database is coming to the attention of the business public with a series of equally crazy ads.

Peter Lawrence of Datascene worked on the ads with the agency, Bull Edington. Lawrence says the first ads are mainly to bring the company name to the public eye. "Only when Database 404 has a range of fully developed systems software, will we start to adopt a particular and aggressive approach to individual markets." The highly viable 404 itself is a marvellously compact little machine which resembles nothing so much as an ordinary teletype. This is often one of the problems, says Mr Smurthwaite, the commercial Marketing Manager, when he is exhibiting the machine. People glance idly at it and think "oh yes, another on-line terminal." Database has to underscore for them that the 404 is on-line to itself.

It really took more than passing interest at Fall and Spring Joint Computer Conference, if only because the Teletype is a most unusual shade of Old Gold. (The Teletype Corp helpfully provide equipment in any shade so long as it's beige.)

People have even been known to state they would prefer "that design of Teletype" to their own, and then be surprised that they can have the processor thrown in! (Although that makes it rather an expensive Teletype.)

Appearances notwithstanding, the 404 offers all the facilities and felicities or, for example, a PDP/8, with a good deal more commercial attraction. It has an uncluttered

and entirely unobtrusive processor, *sans* lights, *sans* toggles, etc, but *avec* full debugging facilities through the keyboard, including individual location addressing. A hardware loader eliminates the need for a switchboard to toggle in bootstrap loaders. In addition to its stand-alone capability, in which it can handle up to 15 peripheral controllers with an undetermined number of devices under each controller, the 404 can act as an intelligent terminal, on-line to more powerful tackle. Options range from 64K extra store to the usual peripherals.

This is not primarily where Database sees its market, however. Smurthwaite says the 404 should be capable of offering the small-to-medium user all the computer facilities he might desire. "Certainly a time shared terminal has the advantages of being able to call down the heavy core artillery when necessary, but how often, in the normal commercial environment does one need to?"

He moved on to stress the importance, both psychologically and effectively, of being able to get "hands-on" experience with one's own machine. This would not mean, though, as in the early days of the small computers, that people would be left with the instruction set and told to 'get on with it.' Database plans to provide all the software help a customer needs, whatever the environment, and is quite prepared to subcontract to meet such requirements.

With an experienced staff recruited from major computer manufacturers, and highly trained engineers, many of whom have been to the manufacturing headquarters in San Gabriel, Database is undoubtedly poised for significant market penetration. The company looks like it has good staff and a good product at a good price.

RON OWENS

"Closest remote terminals in Britain? No, two separate Database 404's."



## £5 Million order for GE in Italy

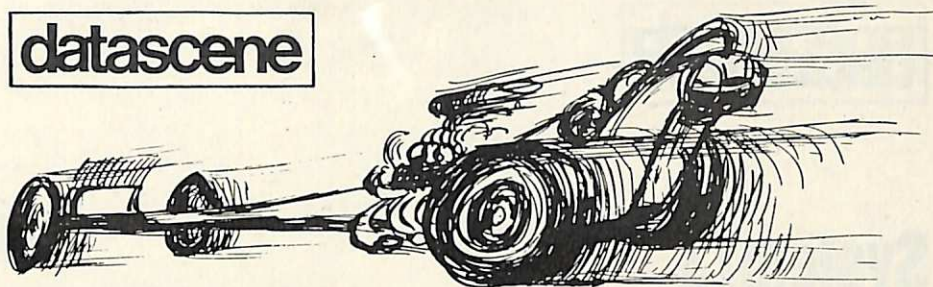
GEIS Italia has announced the sale of two of its massive GE 655 computers, valued together at £5 million to the Credito Italiano bank of Milan. This is the first order taken for the GE 655.

With the installation of the two 655's the system will be steadily extended to link all branches of the system. When it is complete, more than five hundred terminals will be installed, and it is forecast that during peak banking hours the traffic between the terminals and the central system will reach 24,000 messages per hour, with a maximum terminal delay time of less than 5 seconds.

The two 655's will operate in the '3-d' mode, offering time-sharing, batch and remote batch processing facilities. They will each have a main memory of 128K 36-bit words, backed by random access memories with a capacity of some 1.7 billions.

The order for the terminals, in itself no mean sale, has gone naturally enough to the leading Italian company in the field, Olivetti. They will be supplying a number of different buffered terminals.





## Big turnkey order for Logica

International Reservations Ltd has awarded Logica its first major turnkey operation, for the supply of hardware and software for the network of their national hotel reservation system. The order, which is worth more than £100,000, is for a "store and forward" system which will link some 40 to 50 video-terminals to a 360/50 of the National Coal Board at Cannock.

Included in the system will be a dual Modular One, for which Logica have placed an order with Computer Technology Ltd. Initial delivery of Modular One equipment for system evaluation will take place this month, and further equipment will include two communications multiplexers and 24 modems.

Logica claim that the contract heralds, an important breakthrough by a services company into total systems supply." The supply of turnkey services has been stressed as one of Logica's marketing strategies since its formation last year. They confidently predict that they will have a further substantial volume of turnkey orders by the end of the current year, which will accord with an overall growth trend in this particular field of computing.

## The Judge

The court reassembles. The defence attorney, who asked for a short recess, is fluently quoting now all the precedents relevant to the case. The judge, hesitant earlier, takes charge with supreme confidence. Where have they been?

The answer is simple, if the place is Germany and the time is after November, 1971. Each of them went out to phone JURADAT in Berlin.

JURADAT is an agency set up under government auspices to operate a juristic databank, which holds codes of law, case histories, patents and legal publications on computer files and is open to access for all German lawyers.

## Border Guards use Burroughs

Smuggling across the Mexican border ain't what it used to be. Not since Burroughs installed a B-5500 on-line system at San Diego, California.

The system forms part of a nation-wide criminal information network recently approved by President Nixon. The B-5500 will accept enquiries from terminals in traffic lanes on the California-Mexico border.

An enquiry is sent to the machine which retains a master file of stolen vehicles and wanted persons; the response is flashed back within seconds. If he is satisfactory, the driver is allowed to proceed.

The £850,000 order covers an additional network of terminals which will be strategically sited throughout the US, linked with the B/5500 system and the FBI's National Crime Information Centre.

## Drag show from EAI

Feeling that the moon situation was rather delicate at present, EAI have chosen not to demonstrate a moon landing simulation on their 7945 hybrid computer system at the forthcoming IEA exhibition. Instead they will demonstrate "Dragster Vehicle Simulation" in which visitors to stand G105 can participate in solving problems involved in the design of a small racing car.

The purpose of the simulation is to minimize the  $\frac{1}{4}$  mile time for a dragster by altering the parameters in a mathematical model. Over eager drivers will be protected against excessive 'wheelies' by what EAI dryly describe as "a margin of safety

against pitchover of the vehicle."

Results of visitors attempts to better Art Arfons 270 mph in 4 seconds, or otherwise, will appear on a sophisticated dynamic display. The hybrid computation, according to EAI, is carried out some 300 times faster than on a digital computer.

EAI were at first worried when they exhibited the simulation program in the States that people would feel it was a paltry substitute for a moon landing. However, they have been surprised at the interest the dragster simulation has occasioned, even though drag racing is a tremendously popular sport in the States.

# Worried about decimalisation?

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# System/3 360 Interface

The long-awaited communications adapter announced by IBM last week for delivery in early 1971. It will eventually enable users to establish direct teleprocessing links between System/3 computers and the System/360 range.

The adapter for System/3 operates in binary synchronous communications mode and hence is known in typical IBM fashion as BSCA.

It runs at 600, 1200, 2000 or 2400 bits/second, handling EBCDIC or ASCII coding. It can work in a multipoint network with other BSC terminals, with a 360 as the master station. The central 360 can be any model, including Model 20 but excluding Models 44 and 67 unless the 67 is operating in 65 mode.

The 360 can be operating under DOS or OS and the System/3 can communicate indirectly with the other terminals through the System/360.

Modems which may be used are the IBM 3976 model 3 and 3977 model 2. Datel 1 model 5 and Datel 7 facility 3 may also be used by virtue of self-clocking option on the BSCA.

The RPG-II telecommunications feature allows the programmer to treat the BSCA as just another I/O device. The programmer completes a telecommunications specifications sheet and RPG-II does the rest. It establishes the line connections, exchanges identification sequences, transmits and receives data and closes down the line.

The new adapter, with the necessary expansion device on System/3 will rent for £144 16s per month. Purchase price will be £7,355.

The RPG-II teleprocessing capability is an IBM program product which will be available under licence at £14 12s per month.

Customer delivery of the new BSCA is planned to commence during the first quarter of 1971.

## Computers in hospitals



*A general view of the Royal Marsden Hospital's new computer installation now being used to aid radiotherapy planning.*

Two recent announcements of computers in hospital environments illustrate opposite ends of the applications spectrum. The first, an 8K two-tape PDP8 at the Royal Marsden Hospital, Surrey, is performing a very specialised service in the radiotherapy planning department. The Royal Marsden is one of the world's leading centres for the treatment of cancer and allied diseases, and the computer will be used to expedite the plotting of treatment isotope curves hitherto carried out by the radiation planning department.

Scheduling a course of radiation treatment calls for considerable skill and has always been time-consuming. X-rays must be directed to have maximum effect on the diseased areas without damaging healthy tissue; the duration and intensity of radiation beams depend on the size of the tumour and other factors. By using a Tektronix tube to alter the various parameters, the planners can arrive at an optimum dose, at which point a hard copy is output on a plotter. The final plan is

used by the radiographer in setting up the X-ray machines for treatment.

On a completely different scale are the activities currently being organised by the University of Essex and Guy's Hospital. They have been working together to provide what is claimed to be Britain's first computerised patient data retrieval system. The pilot scheme will give the many doctors at group practices in Thamesmead and Harlow, instant real-time access to patients' medical histories stored in the University's Honeywell 516.

The terminals are Marconi-Elliott Videodata 4000's. These will allow doctors to display existing data on patients on-screen during consultation. In the course of the examination, the doctor will be able to update any of the information in the computer by typing in new symptoms, treatment or prescriptions, through the terminal keyboard. In addition, each surgery will be equipped with a teletype to be used by the receptionist for appointments and prescriptions.

## Univac v CSI. LACES tied into knots

Hackney Marshes, that delightful little expanse of windswept open space in East London that passes for a sportsground, was the setting for one of the season's most intriguing soccer matches on Friday. It brought together two of the protagonists in the famous LACES cargo handling punch-up at Heathrow.

Defending the gas works end, nattily attired in pea green, were Computer Sciences International, the software winners, and facing them at the skyscraper flats end were the hardware losers Univac, resplendent in varying shades of white. A capacity crowd of 19, many of whom were Americans getting a late briefing on the rules of British football as distinct from their own rough-house variety, waited eagerly for the referee to begin the proceedings.

Unfortunately, however, a referee was the one thing that the game did not have. But this was swiftly remedied when a gallant

CSI supported was press-ganged into service. And after brief preliminaries the match kicked off. It began scrappily with neither side being able to gain ascendancy and the first quarter was very dull. There was general agreement amongst the spectators that a simulation using CSI software on a Univac machine would have been much more interesting.

The game desperately needed a goal to spark it into life and that is what CSI centre-forward Colin Underwood gave it. After 20 minutes he planted a fine header past the groping Univac keeper to put his side 1-0 ahead. Their jubilation was short-lived, however, as Univac retaliated in the finest possible style. George Lloyd won the ball in a goal-mouth scramble and equalised.

But straight from the restart the greens stormed back into the lead to bring the game close to boiling point. But no more goals came before half-time, which thus saw

the score as 2-1 to CSI. With no oranges and certainly no tactics to discuss both teams changed straight around.

For some reason best known only to themselves, Univac transformed their play in the second half. Their program had clearly been debugged and they were operating on-line at full power. Poor CSI had no answer to the strong running, clever play that the whites now began to produce. With the chants of 'attack, attack Univac' ringing in their ears, the hardware hardmen swept down on the software side's goal.

After a great deal of pressure had been absorbed the CSI defence eventually cracked and Univac began to score at will. There were two goals apiece from deadly twin strikers Rick 'The Cannon' Gannon and Ron Harper, and a sixth was added by Russell Telfer, the most fashionable man afield, in a see-through shirt and maxi shorts. A triumph of revenge for Univac.



# Big brother systems beginning in Government

A NEW REPORT FROM THE CIVIL SERVICE DEPARTMENT reveals that personnel records are being computerized, and automated systems are already being devised to allow management of individual depts to use personnel and pay records from a centralized computer.

According to the new report, published today (May 6), the use of computers in the Civil Service is expanding rapidly each year and the computer power in Government departments has increased by 50 per cent per annum over the last five years.

These facts as revealed are stated in the first report to Parliament of the Civil Service Department. Figures show that 97 computers are in use for administrative purposes and 90 for scientific purposes. A further 24 are on order for administration and 52 for science.

The report says that the total number of systems designers and programmers has increased at a rate of over 25 per cent annually during the past 11 years and at the end of March 1969 was over 2,200.

"But the Civil Service faces, like outside organizations, a shortage of ADP staff trained to design the more complex computer systems," it goes on.

## Help with courses

"To help in overcoming recruitment and training problems civil servants have been given bursaries to take courses leading to degrees on computing science. Departmental training, using sandwich courses, was encouraged. Work is continuing on developing methods of personnel selection and evaluation of aptitude tests, and on ways of reducing losses of trained programmers."

The report says that as departments' ADP experience has increased the CSD has been able to divert some effort from helping them with the projects to greater concentration on long-range policy and planning which cut across departmental boundaries and to developing expertise in selected areas to provide a consultancy service.

A CSD team, including a senior management consultant, carried out a review of plans for the future use of computers by departments in order to establish the ADP requirements of central government during the next ten years. Their report provides the basis on which the Government can plan effectively for co-ordinating development of systems and the recruitment, training and career management of the specialist ADP personnel needed.

A group has been formed, states the report, to provide a pool of expertise to which departments may turn to seek expert advice on such subjects as bureau support, information retrieval and data banks, data communications including transmission input and output devices, and advanced system design including real-time and system modelling.

The CSD monitors procurement of computers and takes part in evaluating all major tenders.

In collaboration with the Ministry of

Public Building and Works progress was made on the design of a standard computer building for the Civil Service.

The report points out that the CSD helped in the planning of a large number of departmental computer projects. In the autumn of 1969 about 135 projects were in progress. Typical examples of the more important are:

## Police records

The Police National Record Scheme, intended to make instant information available to all police forces via a national communication network.

New real-time supply system for the RAF which will have direct data transmission links with depots and units.

Evaluating tenders for the most powerful computer in the country to be used for weather forecasting by numerical methods.

A computer system costing over £3 million for holding central records of driver and vehicle licences at Swansea.

An ADP system for the Business Statistics Office.

According to the report, existing personnel

records and procedures for collecting and transmitting information about staff do not fully meet the needs of modern management. Accordingly, a feasibility study was carried out to determine whether it was economically possible to utilize modern computing and telecommunication techniques to provide a new personnel information system for the Civil Service. The first steps towards the implementation of such a system are being taken.

Most pay accounts for non-industrial civil servants are maintained by computer and the aim is to complete the coverage and associate with the pay records a limited amount of additional personnel information. This combined pay and personnel record, standardized on a number of departmental computers, will form a base from which data will be transmitted to a central computer which will make information immediately available to the CSD without the necessity of calling for periodic paper returns. Individual departments will also have access to the information they need for staff management.

REG ROBINSON

## Would you sell a used computer



## to this man?

His name is Parry Mitchell, his company is Boothe Computer and they're on the look out for used hardware. Boothe are interested in all IBM equipment, including peripherals (especially 2311 disc drives), and also in certain other manufacturers' equipment. If you are thinking of replacement or have anything to sell right now, why not get in touch with Parry Mitchell — he'll be happy to make you an offer!



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## ICL manager joins Leasco



Leasco Systems and Research has appointed Al Gabay, a specialist in computerized management information systems, as manager of its Information Systems Division.

Al Gabay formed the Business Information Systems department at ICL, where he was responsible for the development and marketing of a wide range of information retrieval packages, indexing and cataloging, typesetting, and financial systems.

## CSI gets water job

"If we make a hash of this contract our name will stink in every town hall in London." Peter Ward, marketing director of Computer Systems International, made this comment about the recent order from the Metropolitan Water Board for pre-decimalization re-programming of its weekly payroll suite.

But he added that the company was entirely confident of completing the contract on time—and up to schedule. Every London borough is represented on the Metropolitan Water Board, hence the comment.

The contract involves re-specification and re-writing of the current 360, 1401 compatible system. CSI will also implement its modular hierarchical programming standards, 360 basic modular tester, and some specialized Assembler software.

The £15,000 job is scheduled for completion in November.

## Touché

Thank you for printing my letter, albeit over my misread name.

Please explain your comment on complaints about library services being "a political issue." As a librarian (previously public, now industrial) I welcome genuine complaint, otherwise I have no 'feedback' for 'decision-making' (or whatever jargon the computer world is wont to generate buzz-wise).

Mr Jordan's query was not 'information retrieval.' He asked from where he could borrow a specific book. You published many specific answers, although I suspect he had never even contemplated them in the first place. In fact, once he tried these sources he should find no cause for complaint. You appear to assume that anyone complaining about service must be trying to burn down Parliament, and that boat-rockers are not to be tolerated in this data-ordered society.

I am not sure that I like the *political* implication behind the heading you gave my letter, seeing that politics can be read into anything.

R D Gee  
19 Raleigh Road  
Richmond, Surrey

## CalComp takes a stand

I should like to point out an error in *Dataweek* on April 8.

I would draw your attention to the photograph on Page 14. The scene depicts the CalComp stand at the Exhibition at Software 70 in which I am standing before our display talking to a charming group of colleagues from ITT.

I would never deprive ITT of the pleasure of claiming the attractive foreground as their's, but I should like to stake my claim both to the Calcomp stand and my own living self!

J W S Preston  
Marketing Assistant  
Calcomp Limited  
Burgoin House  
Hampton Wick  
Kingston, Surrey

## Idiion Erratum

With reference to your article under the heading of CG70 in *Dataweek* of April 22. We would like to point out certain defects in your comments on the IDIIOM

and would appreciate the insertion of a correction in one of your forthcoming issues.

Firstly the equipment is the IDIIOM and not IDIION and it is not hooked up to a Varian 620i. IDIIOM is a stand alone system of which Varian is a part. It is being manufactured in this country by Information Displays International at Southampton and the labels affixed on this particular machine were just Information Displays International Limited instead of Information Displays Incorporated.

With regard to your comments on another Brand X product inside, there is another mistake here in that the tape equipment was not a DEC tape as you suggested but in fact is a model CD601 of the LINC tape system. Its purpose was purely one of convenience and at the present moment is not an integral part of the IDIIOM system. Although it is available as an option.

It is appreciated that it is difficult to ensure that the details of a specification are correct in a very short summary and therefore we hope that you can include a correction to this in your next issue.

L Rowland  
Managing Director  
Compugraphics International Limited  
Aldershot, Hants

Sorry about the IDIIOM . . . some IDIIOT misspelled it.

We have checked with Digital, who inform us that the CD601 of the LINC system is still exclusively a Digital Equipment Corporation Product, and was not acknowledged as such at CG70.—Ed.

## Wrong Hauptbahnhof

Cab-drivers may be nomadic—but not to the extent shown in the photograph accompanying your article, "Frankfurt cabbies get it first." The Hauptbahnhof at Frankfurt is an all-too-familiar sight to the managers of our company, and unless I am very much mistaken the one you showed is over a hundred miles away.

Come, *Dataweek*—in the past you have shown the depth of your research (Sloan Computer Bureau *et al*), so how did this one slide through?

N B Hough  
Project Manager  
14 Fenchurch Avenue  
London EC3

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## People

**J Kevin Overstall** has been appointed senior consultant with **Attwood Auerbach Limited**, London. Kevin Overstall was previously with **Associated Industrial Consultants Limited**.

**Data Recognition** announce **Brian F Bradford** as senior sales executive. Bradford joins **Data Recognition** from **IBM**.

A new district manager for **Raytheon Company's** Computer Operation in Santa Ana, California is **John W Bartlett**. He will be responsible for sales of Raytheon Computer's data logging and other peripheral equipment and logic modules.

**John Everest** has been appointed computer systems manager by **Interdata Limited** of Wembley. Everest was formerly a hybrid systems specialist at the **CEGB** in London on behalf of the **EAL**.

A director of operational research has been appointed by **London Transport**. He is **Dr D A Quarmby** who was seconded to the Ministry of Transport in 1966.

**Honeywell** announces three new appointments: Director of production for their Industrial Products group is **Ken H Urquhart** who was previously production manager for Honeywell's computer operations. Urquhart replaces **Alex Gordon** who, in turn, is taking up an assignment with the automation company's industrial division in the United States. **Gerry Cregan** becomes field marketing support manager and **Jack Clarke** managing support manager for the southern region. Cregan joined Honeywell in 1965 and Clarke in 1963.

## Installations

**Burroughs Machines** have opened a demonstration and service branch in Coventry. The region has been served for the past two years from the company's Midland HQ in Birmingham but continued expansion of local industry and commerce has created the need for a more defined and comprehensive service. Burroughs has supplied a range of computing equipment in this sales region which includes Warwick, Rugby, Leamington and Stratford. Customers include the **Reliant Motor Company**, **Tamworth**, **Benfords of Warwick** and the **Rugby and Warwick Building Society**.

**Oldham & Son Limited** will take delivery of a **Honeywell 110** computer at its Denton head office and manufacturing centre in September. The installation is worth £55,000. The configuration will comprise a central processor with 12K store four magnetic tape units, a line printer and card reader.

**Precision Air Control** has just completed and commissioned a comprehensive controlled

environment computer area for **Electrosila** at Leningrad. The installation is for a complete turbine test base and the **ICL 1903A** will be used in tandem with a **Ferranti Argus** for processing data from turbines under test. This is the first Western computer sold in the USSR to an industrial user rather than for government use. The order is valued at £25,000.

## News

**Addo Limited** announce that their new electronic calculator, the **Ten/3 Mark II** has been reduced in price from £360 to £320.

## Orders

The **Gliksten Group** has placed an order valued at over £47,000 with **Philips Electrológica Limited** for a **Data 8000** visible record computer, two **P352** office computers, together with allied peripherals, which will provide part of Gliksten's EDP requirements. Delivery of this order will commence early in October of this year.

The **Netherlands Bank of South Africa** has ordered a **Burroughs B 3500** on-line computer system. The system is scheduled to come on-line in the second half of 1970, and will provide immediate information on current account, investments and automatic service work for customers such as wages or stock controls.

**Sanders Associates Inc** has been awarded a \$4,229,488 US Navy contract for classified electronic components. The contract was processed for the Naval Electronic Supply Office by the Defense Contract Administration Services Office.

## Diary

The **Leeds and Sheffield** Branches of the **BCS** are holding a joint open-day exhibition of computer applications at **St Chad's Hall**, **Leeds** on June 8 and at **Hallam Towers Hotel**, **Sheffield** on June 9. The exhibition will be open from 2.30 pm to 8 pm on both days.

**Bis Training** courses: May 18-22, **Basic Business Systems Analysis** to be held at the **New Imperial Hotel**, **Brighton**, **Sussex** and on May 27-28 **Communications and Real Time Systems** at the **Rembrandt Hotel**, **Thurloe Place**, **SW7**.

## New Products

An automatic flowcharting package for **ICL 1900 Plan** programs is now available from **J Harwell Data Processing Limited**. Designed and produced by their own team of software programmers the package is being utilized by several **ICL** installations to help

document customers' existing **Plan** programs and also to aid the development of new programs. Source programs may be input in standard format from cards, paper tape, magnetic tape, cassette tape, **EDS** or twin disk store. After the title page, a full program listing or data listing only may be output if required. A cross reference listing is then given for all branches and all sub-routines showing label names, if any, cue names and position both in the source listing and in the flowchart. Single segments, whole programs or a batch of programs can be flowcharted in any run.

**Raytheon Company's Semiconductor Division** has introduced a retriggerable monostable multivibrator with a wide range of applications in delay pulse generators and similar circuits. Notable features of the circuit are high-speed operation (it has a repetition rate greater than 10 megahertz), complementary DC-level-sensitive inputs, and optional re-triggering lockout capability. The device provides an output pulse width that can be predetermined accurately over the range from 50 nano-seconds to infinity by use of an external resistor and capacitor. It has four DC-level-sensitive inputs; two are active-level High and two are active-level Low. The **RF 9601** and **RF 8601** will respond to trigger inputs when in their active timing state and time themselves or from the last input pulse received. Applications include delay pulse generators, long delay timers, pulse absence detectors, frequency division, digital low pass filters, **FM** demodulators, and astable multivibrators.

### On the Royal Line

*Old King Cole  
was a canny old soul,  
and a shrewd tycoon was he,  
a prompt trouble-shooter,  
he hired a computer,  
complete with peripherals three.*

### GIGO

*Little Jack Horner  
sat in a corner  
testing a programme out,  
but his data was trash,  
and the print-out such hash,  
that his project went up the spout.*

### Loggerheads

*Jack Sprat computed on his thumbs -  
his wife, intuitively;  
so he preferred the digital -  
the analogue style she.*

ABACUS



# dataweek appointments

## Beckman® Instruments Limited

The Data Processing Department requires an experienced

### COMPUTER PROGRAMMER

to augment a small team currently being formed to prepare for the installation of the company's first computer.

Applicants should be in the age range of 20-25 years and be educated to "A" level standard. They should have at least 2 years' programming experience on I.C.L. 1900 Series Computers, definitely in COBOL and preferably also in PLAN. Most important is experience of direct access devices using index sequential.

The successful candidate will be responsible for the programming section and its development including assisting trainees. The ability to work to standards is essential as is the ability to work with the minimum of supervision. There are good working conditions including 3 weeks' holidays after one year's service and a non-contributory pension and life assurance.

Please apply giving brief details to:

Employee Relations Manager,  
Beckman Instruments Ltd.,  
Glenrothes, Fife.

## HIGH GRADE SYSTEMS ANALYSTS

£3,000

An international client who will soon be spending over £1,000,000 a year on E.D.P. facilities, requires three high grade systems analysts to start on the next stage of development.

Basic requirements are

- \* Four years' E.D.P. experience with at least one year as a senior systems analyst
- \* To have completed implementation of at least one major project
- \* Experience of using magnetic disc files
- \* The ability to discuss requirements with and explain proposals to users and to ensure smooth implementation of agreed systems.

Brief but comprehensive details of your career should be sent to MD785, Executive Selection Division, Cooper Brothers & Co., Abacus House, Gutter Lane, London EC2, stating any firms to which you do not wish your application to be passed. Strict confidence will be observed.



# HARPER ASSOCIATES

A leading Company based in London and the North West, a member of a large International Group engaged in sophisticated Communication Systems, requires the following personnel to implement recent rapid expansion and further planned development of their IBM 360 installation which includes Models 40, 50 and 65. Candidates seeking to advance their careers in all aspects of modern computer technology, will enjoy excellent starting salaries and generous fringe benefits.

### SENIOR ANALYSTS

£2,500 - £3,000

With 2 years' systems experience and a sound programming background.

### PROGRAMMERS

£1,800 - £2,250

A minimum of 1 year's experience using COBOL and PLI.

### SYSTEMS AND APPLICATION PROGRAMMERS

£2,000 - £2,500

Systems programmers should be software oriented. Application programmers, preferably with engineering or mathematical experience, must have FORTRAN while COBOL would be advantageous.

### SENIOR OPERATORS

£1,500 + shift allowance.

Aged between 18 and 22 and used to IBM 360-40/50 and 65, operating under OS.

### SHIFT CONTROLLERS

£2,000 approx.

Experienced men capable of controlling and scheduling operations.

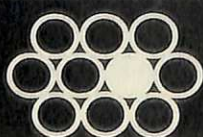
### CONTROL CLERKS

£1,200 - £1,400

Applicants who feel that they match any of the above requirements should arrange for an immediate confidential interview to discuss further details.

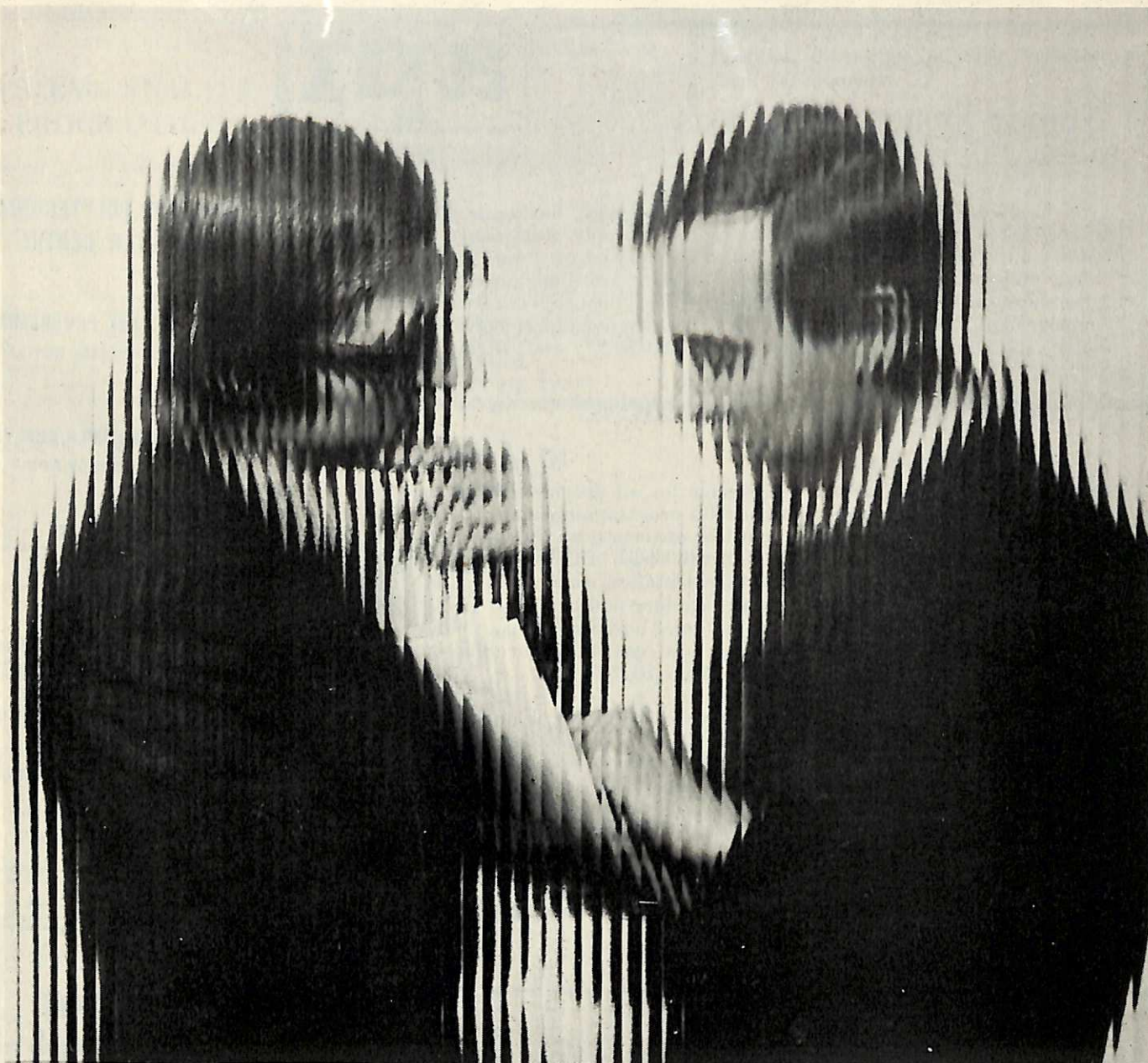
Write or telephone today and ask for Bill Gudgin

**01-837 6444**



(management consultants) Ltd.  
Personnel House, 272 Pentonville Road, London N.1.





# Software experience from the inside

A certain type of programmer feels there's something missing in common or garden programming. Having got all the satisfaction you can from straightforward writing of programs, you want a job with more freedom to use your undoubted extra talents.

This job—software support—doesn't suit everybody. You need diplomacy, resilience, a bloodhound instinct for fault-finding, and the ability to inform without seeming to teach from on high.

Helping our customers all over the world to get the best out of the only really significant, original, large-scale software output in the country, you'll become a wise expert indeed.

Interfacing between software writers and systems engineers through lectures, documents, manuals, correspondence, telephone and Telex, you'll gain invaluable experience of manufacturer-software from the inside.

Just about everybody you'll deal with will know what they're talking about, and you'll be expected to know just as much and more. Two years' 1900 experience is ideal. Eighteen months will do, and we're still prepared to talk if your experience is not on 1900 but you're obviously going to make a very good software supporter.

Locations: mostly Putney, but we need a few of you in Reading. Salary: up to £2500, depending on background, experience and qualifications.

Please write or telephone quoting reference DW 280S, to:

W. D. Camidge, International Computers Ltd.,  
Lily Hill House, Lily Hill Road, Bracknell,  
Berks. RG12 2SJ. Tel: 0344 20611

**International Computers**





## Senior Systems Analysts

to £2,700 +

With at least 2 years' minimum experience, having designed and implemented at least one system, are eligible to apply. Each man is responsible for the production of fully detailed system and program specifications for a project and for leading and coordinating team assignments. A programming background, but *essentially* the capability to work directly with management at all stages is desired. This position includes top prospects, top salary and 6 weeks' paid holiday. Tel: 01-734 8222. Ref. BL/50.

## Chief Programmer, Executive

to £3,200 +

YOU will be directly responsible for all programming activity in the Computer Group. Experience in 360 programming under DOS, using COBOL and BAL is essential and must be evidenced by the previous implementation of some major project. You will assist in the areas of feasibility studies, investigation and project implementation, supervise programming teams, give guidance on programming technique and participate in training, with responsibility for the operating system. The salary, responsibilities and 6 weeks' paid holiday indicate an important opportunity to those qualified and available now. Tel: 01-734 8222. Ref: BL/51.

Our client is Suburban and London based and is introducing new IBM hardware and peripheral equipment in a progressive environment, preparing for implementation of exciting commercial applications which are expected to forge new ground in providing highly advanced management information systems. Working conditions, management skill and leadership are first class. Excellent opportunity for the sound businessman looking for future growth in line with capacity.

API INTERNATIONAL · 133 OXFORD STREET · W1 · 01-734 8222

**api**  
INTERNATIONAL

### BRIGHTON POLYTECHNIC COMPUTER CENTRE

#### CHIEF SOFTWARE PROGRAMMER

(£1,870 — £2,445) S01/2

#### SENIOR PROGRAMMER/ANALYST

(£1,800 — £2,015) APV

#### SHIFT LEADER

(£1,345 — £1,575) T5

The Centre operates ICL 1905E, IBM 1401 and IBM 1130 computers. The above posts will be primarily concerned with the 1905E computer.

The starting salary will be in accordance with experience and qualifications.

Further particulars and application form (returnable by 18th May) from The Registrar, Brighton Polytechnic, Moulsecoomb, Brighton, BN2 4GJ.

Hambros  Group

International Merchant Bankers

### SYSTEMS ANALYST £2250 — £3000

Our 1903 and 1902A may not be the biggest computers in the City but they must be amongst the most versatile. As a leading International Merchant Banking Group, the demands we make on them are pretty great. Current projects include portfolio valuations, sterling banking, foreign exchange dealing and our unit trust work.

To keep up with the Group's expansion and diversification, we have a number of interesting projects in the pipeline, and we are at the early planning stage for an on-line system. Want to join us? If you have two years' systems analysis experience (and a degree preferably) and would like to talk about putting it to work at Hambros, telephone me now, or write if you'd rather.

**F. Bithell, Systems Manager,  
Hambros Bank, 41 Bishopsgate,  
London E.C.2. (Tel: 588 2851 ext. 445)**

### APPOINTMENTS AND SERVICES ADVERTISEMENT RATES

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## SYSTEMS ANALYST/ PROGRAMMER

Applications are invited for the post of Administration Systems Analyst to the University. The successful applicant should have experience of I.C.L. 1900 series computers, a knowledge of COBOL and have been employed on commercial projects, preferably in an accounting environment.

This is an interesting position involving the adaptation of administrative and accounting procedures to a 1905 computer with strong technical backing. The post will eventually lead to work of a wider technological nature. The salary will be negotiable within the range £2,000 to £2,500 p.a.

Applications should be addressed to the Secretary, Room A317, The City University, St. John Street, London E.C.1.

## PROGRAMMERS I.B.M. 560

At least 1 year's experience of Basic Assembler Language. Knowledge of 1400 Autocoder an additional advantage.

Generous  
annual leave

up to  
£2,280 p.a.

+  
Voluntary, paid  
overtime

Apply to:- (Quote ref. DW/5)  
The Establishment Officer,  
Metropolitan Water Board,  
New River Head, Rosebery Avenue, E.C.1.

## COMPUTER OPERATORS

- ICL 1902/32K, 6 tapes, cards.
- Excellent conditions
- Housing available.
- Removal expenses

Telephone now (reverse charges) Kelshal 213 or write to Kasad Computer Services Ltd., 123/124 The Stow, Harlow, Essex.

## Senior Programmer Systems Analyst Programmer

Our client is part of a well-known national company engaged in the manufacture of consumer and industrial products, with a factory situated in an unusually pleasant part of the Yorkshire countryside. An ICL 1902 computer is scheduled for installation in early 1971.

The following vacancies exist:

### Senior Programmer

An experienced Senior Programmer in ICL COBOL and PLAN. He must be fully conversant with ICL software and have wide systems experience.

The intention is to promote the successful candidate to Chief Programmer as the computer team builds up.

### Systems Analyst

A Systems Analyst with experience in commercial applications, preferably on an ICL computer.

### Programmer

A Programmer with experience in ICL COBOL.

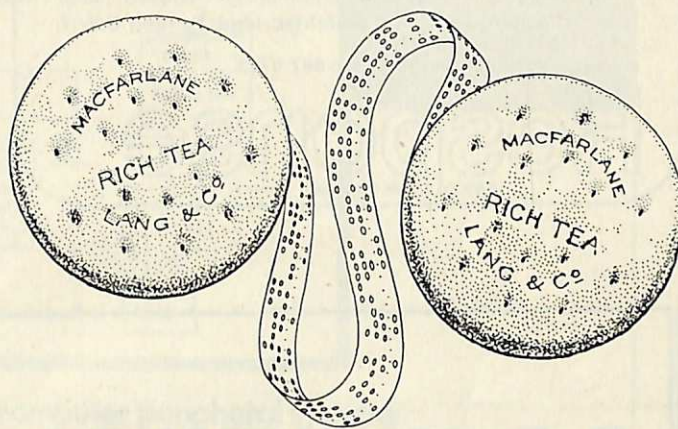
All positions offer good salaries and the opportunity for advancement, both within the operating unit itself and the parent company as a whole, where the growth of computer systems is increasing at a high rate.

(Ref. D9049/DW)

Replies will be forwarded direct unopened and in confidence to the client unless addressed to our Security Manager listing companies to which they may not be sent. They should include comprehensive career details, not refer to previous correspondence with P.A., quote the reference on the envelope and be sent to:



P.A. Advertising Ltd.,  
St. James's House, Charlotte Street,  
Manchester M1 4DZ. Tel.: 061-237 4531.



# United Biscuits need Programmers.

We need programmers with minds to match our computing power for the 1970's. Salary about £2,000 per annum.

2 x 128K, 360/40, 2 x 2314 plus 58 x 2740's  
Ferranti Argus 400, Honeywell DDP 516, IBM 1130  
2260's on-line Sales Ledger interrogation

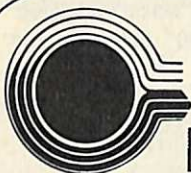
for TP Order Entry System, Process Control, Automated Stock Control.

Applicants must have at least 2 years' experience, including 360 BAL.

Application forms from:

**Mr. R. B. Ayers, Office Personnel Manager,  
United Biscuits Limited, Binns Road,  
Liverpool L7 9NG. Tel: 051-228 4828 (reverse charges).**





## Britain's fastest growing Time Sharing Service

Leasco Response Limited's time sharing systems now bring computing services within reach of all companies and enables every technologist and manager to use our powerful computers. Expansion has now provided more opportunities for people of proven ability to apply their experience to important new areas of development in applications software.

We require professional computer staff with experience in any of the following areas.

**Management accounting  
and cost control**  
**Financial accounting**  
**Stock Control**  
**Production Control**

**Project Management**  
**Investment Appraisal**  
**Scientific and Engineering  
Programming**  
**Linear Programming**

Salaries will be negotiated up to £2,500 depending upon experience.

Please write or telephone for Application Form:

Leasco Response Ltd., 197 Knightsbridge, London S.W.7.

Tel: 01-589 4577 Ext. 57.

Outside working hours Tel: 01-467 0713.

# Response

LEASCO TIME SHARING

# MSL

**Management Consultants  
in Human Resources**  
17 Stratton Street London W1

## Development Manager Systems and Controls about £3000 Midlands

The company is the newly-formed R and D subsidiary of a British textile machinery group with 2500 employees and a turnover of £11 million. The man appointed will be responsible to the Chief Executive and will be concerned primarily with the development of control systems for volume production knitting machinery and with the provision of specialist services in this area throughout the group. Candidates, under 40, should be graduates in electronics, electrical engineering or another relevant discipline, with R and D experience including the management of electronic control systems projects from inception to completion. Experience in textile machinery, machine tools or process automation and knowledge of digital techniques, would be useful. Car provided; re-location assistance.

J. D. Boyle reference KF.1290.



**The MSL Consultant has analysed this appointment**

Further information will be sent if you provide your name and address by telephoning 01-629 1844 or writing to the consultant quoting the reference. Your enquiry will be in confidence.

# D.P. IN NEW ZEALAND



Based in Wellington, a newly formed container shipping company is designing its management structure to make best use of a computer facility in administration and control of the operation. The company is closely linked with Associated Container Transportation, the highly successful British consortium which pioneered the use of computers in this field.

Conditions of employment for these permanent appointments will include relocation expenses.

Please write or telephone for an application form to Michael Williams, Urwick Dynamics Limited, St. Andrew's House, 40 Broadway, London S.W.1. (telephone 01-839 2487) quoting the appropriate reference.

## D.P. MANAGER Up to £4,500 (c NZ\$9,600)

Data Processing Manager, who will report to the General Manager, and will advise management on the formation of the business systems of the company. He will control the design, implementation and operation of the data processing systems. The man appointed will have had extensive systems design experience in a senior capacity and the knowledge and ability to control a major commercial D.P. Project. (Ref. 404/D).

## SYSTEMS MANAGER Up to £3,500 (c NZ\$7,500)

Systems Manager, who will report directly to the D.P. Manager and will be responsible for all systems and programming work. He must have a programming background and at least 2 years' experience as a systems analyst. (Ref. 405/D).

LONDON BOROUGH OF  
HOUNSLOW

Isleworth Polytechnic  
London Road, Isleworth  
Middx

Applications are invited for the following posts which become vacant on September 1, 1970

**LECTURER GRADE II and  
LECTURER GRADE I in  
COMPUTER STUDIES**

A lecturer in Computer Studies required to assist with the organisation and teaching of full-time and part-time computer courses to intermediate level (C & G 319). Applicants should have appropriate qualifications and relevant industrial or teaching experience.

### SALARIES:

Lecturer Grade I £1,195-£2,165

Lecturer Grade II £1,912-£2,502

ACCORDING TO QUALIFICATIONS AND EXPERIENCE.

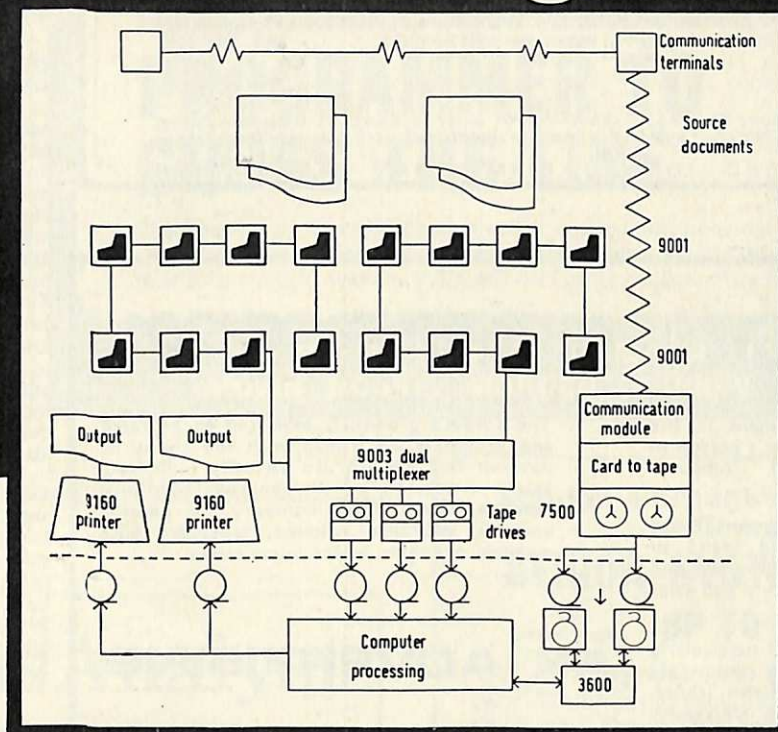
Further details and application forms may be obtained from the Principal, to whom completed applications must be returned by May 13, 1970.



**Urwick Dynamics Limited** 40 Broadway, London SW1



# Are you one of the 50 new people MDS are looking for?



## New MDS ranges of sophisticated computer peripheral systems (the diagram shows just one example) require added sales strength and technical back-up

Only five years after MDS pioneered direct entry on to magnetic tape and introduced the first ever keyed data recorder, over 30,000 such units are now in use throughout the world.

But today MDS leadership extends far beyond the field of simple data entry. The company has developed a succession of advanced new peripheral systems (including communications terminals, line printers, card punches and readers, paper tape punches and readers and media conversion units as well as the

basic ranges of data recorders) which increase the scope and raise the capability and cost effectiveness of MDS data processing techniques.

Such sophisticated systems require for their successful marketing top class sales and technical personnel.

Exciting opportunities in this growth organisation (from zero to £40 million p.a. turnover in five years) exist in the following categories:

### 10 SALES EXECUTIVES

— earnings potential in excess of £5000

Applicants must be over 28 years of age with a record of successful selling in the data processing field. The successful candidates will like the idea of joining one of the highest qualified teams of Sales Executives in the country. They will relish the challenges and demands of selling in the EDP field. And they will have the confidence and capacity to earn in excess of £5,000 p.a.

### 2 OEM SALES ENGINEERS

— basic £3000 plus commission

First-class OEM Sales Engineers are required to handle the sale of sophisticated peripheral equipment to computer manufacturers and other electronic equipment users.

Applicants for these important positions must have a demonstrably successful sales career and a good technical background in electro/mechanical equipment. They must be capable of earning a high commencing salary plus commission and have the qualities necessary to meet a challenging job in a successful and growing company.

### 30 CUSTOMER ENGINEERS

Attractive salary according to age and experience.

Substantial strengthening of Customer Engineer representation throughout the U.K. is currently in hand and up to 30 new appointments are now required to service many areas of the country and to maintain and develop the company's relations with and responsibilities to its many customers. These are important positions requiring, essentially, experience in solid state electronic logic circuits, magnetic tape units, printers, etc.

### 3 TECH. SUPPORT ENGINEERS

£2000 plus by negotiation.

High-calibre engineers, experienced in development or field engineering, required to assist sales teams with the technical problems of advanced peripheral systems.

Opportunities for these important positions exist both in the United Kingdom and in Cologne, Germany (working knowledge of German essential). Applicants must be capable of earning a high commencing salary and must have the capacity for meeting the challenges of a fast-growing organisation.

### 5 SALES SUPPORT SPECIALISTS

£2000 plus by negotiation.

Either men or women experienced in designing software or hardware systems may apply. For the right people there are excellent prospects for advancement in marketing and sales activities.

#### WHAT YOU SHOULD DO TO APPLY

If you believe you possess the right experience and the necessary appetite for tackling a demanding yet rewarding job telephone (reverse charge calls accepted) Mr. A. L. Hatrick at 01-686 5025 or 01-686 7626. Or write giving details of age and career history to the address opposite:



MDS-DATA PROCESSING LTD.,  
PRUDENTIAL HOUSE, WELLESLEY ROAD,  
CROYDON CR9 3LD, SURREY



## Programmer (Operating Systems) c. £2000

A large international company with an IBM/360 Model 40, and Model 30 require a systems programmer with two years software programming experience (although good Assembler programmers wishing to move into system software will be considered) and a thorough understanding of DOS. Knowledge of COBOL would be an advantage. The man appointed will have the potential to understudy the present software team leader with a view to becoming leader himself in the future. The Company is a leading D.P. user and career prospects within the Management Services Division are exceptional. Generous removal expenses will be paid. Ref. DW 1777

To apply telephone 01-839 6155 (24 hours) or write to ASAP, 11 Waterloo Place, London, S.W.1. Nothing will be disclosed to our clients without your permission.

ASAP LIMITED · LONDON · BIRMINGHAM · MANCHESTER

## MANAGEMENT OF COMPUTER SCHOOL

Our Client, a company pre-eminent in the educational field, wishes to appoint a person to direct its recently established Computer Training School in London.

This is an appointment demanding exceptional personal qualities and a unique blend of academic achievement, technical expertise and highly developed business marketing and sales sense.

The person appointed to this particularly challenging position will be wholly responsible for the autonomous operation of the School. Academically, he should hold a University Degree; technically, he should have extensive practical experience of computer programming and systems analysis.

The school's growth is expected to be rapid and prospects for a man with the ability to develop this growth are virtually unlimited. Salary is negotiable with generous additional benefits which include company car, pension and life assurance schemes, assistance with removal expenses where appropriate.



Write with full personal and career details to Position No. CBM 2437, Austin Knight Limited, London W1A 1DS.

### CITY OF LEICESTER

### TOWN CLERK'S MANAGEMENT SERVICES BRANCH

### COMPUTER SERVICES MANAGER

The City Council has a System 4/30 installation with a total staff of over 40. A Computer Services Manager is required to take charge of this, to develop its use and to provide an effective service to the management of all departments. He will formulate long-term plans, including equipment expansion, and will be responsible for advising on potential areas of application. This post calls for a dynamic and enthusiastic leader with a thorough knowledge of all aspects of computer use and of business organisation and activity, preferably in local government. An appropriate qualification or degree is essential and applicants should be over 35. Salary scale P.O.2 (£2,990-£3,375). Staff housing or lodging allowance, and assistance with removal and disturbance expenses. Application form and further details from Town Clerk, Town Hall, Leicester, LE1 9BG (Tel. Leic 29823, ext. 34), returnable by 8th May, 1970.

## Advanced display systems

Sanders Associates Inc., a world leader in the development and application of Displays, offers Analysts and Programmers a unique opportunity to move into the field of teleprocessing systems based on V.D.U's.

We are expanding and we require Systems Engineers with a desire to widen their experience of this increasingly important area and with a thorough knowledge of assembly language programming. They will be involved in a number of challenging projects and their responsibilities range from initial design to implementation.

We would like to hear from graduates with two or more years' experience of 360 or 1900, particularly with some background in real-time systems; but if you have other experience which you think is relevant, please contact us.

Starting salaries up to £3,500 will be negotiated.

Please write or telephone to:  
C. I. Cowan, Systems Manager,  
Sanders Associates Inc.,  
Bury Mead Road, Hitchin, Herts.  
Telephone: Hitchin 51185.



## DATA PROCESSING MANAGER

**OUR CLIENT** are a company engaged in manufacturing and wish to appoint a data processing manager for their 360/20 computer.

**THE APPOINTMENT** carries with it responsibilities for completing the conversion of existing card systems to disc, the development and implementation of comprehensive installation standards, the supervision of staff development and planning of further applications within the company.

**APPLICANTS** should have a minimum of three years' experience as a project leader or senior analyst at a computer installation with magnetic file and are likely to be earning in the region of £2,500 per annum at present.

**THE POSITION** will provide the successful candidate with the opportunity of putting into practice his total experience of data processing and enable him to participate in the development of an integrated system to assist the company's expansion plans. Applications setting out both academic and business career development should be addressed to

T. E. McGOVERN,  
SYSTEMS DYNAMICS LIMITED,  
62 NORTHUMBERLAND ROAD,  
BALLSBRIDGE,  
DUBLIN 4,  
IRELAND



## PROGRAMMER/ ANALYST

A Male Programmer/Analyst with a minimum of 12 months' programming experience is required for an ICL 1902 installation with cassette tapes. A knowledge of PLAN and tapes is essential.

Initially the duties will be primarily programming transferring existing Punch Card numbers to tape, but we are looking for someone, keen to move into systems, who will be capable of assuming responsibility for new projects in the future. Apply to The Secretary, Herbert Terry & Sons Ltd, Ipsley Street, Redditch, Worcs. Phone Redditch 64261.

## MULTIPROGRAMMING OPPORTUNITIES

Our client is a dynamic and experienced Computer Bureau located in the Croydon area using a HONEYWELL 1250 system with Discs and Tapes. Within a year they will be moving into MULTIPROGRAMMING. The expansion plans are extensive, providing two exciting systems opportunities. The successful applicants will be ambitious, seeking great job satisfaction and a clear cut career path. A continuous programme of training is in operation which will develop future potential, particularly in multiprogramming areas.

## SYSTEMS DESIGNER to £2,600

With imagination and experience preferably with a commercial systems background, and with the ambition to lead a project team. Keenness to develop career into MULTIPROGRAMMING SYSTEMS will be of considerable interest.

## PROGRAMMER TO CROSS THE LINE to £1,800

The position as Systems Analyst offers outstanding potential for a mature programmer who is systems minded rather than hardware orientated. As the installation moves towards multiprogramming systems there will be further opportunities for advancement.

**DATA PROCESSING STAFF CONSULTANTS LIMITED**  
**CROWN HOUSE, MORDEN, SURREY. 01-540 7172**

## Systems Analyst CORNWALL

Do you like the idea of a challenging and rewarding job framed in the beautiful coastline of Cornwall? – You do? Then join Holman Brothers Limited, members of the International Compressed Air Corporation Limited.

**HARDWARE** System/360 model 30

**SOFTWARE** IBM Disk Operating System

**LIVEWARE** A young and enthusiastic team of Analysts and Programmers.

We have achieved a lot in the past four years but expansion now opens the door for you to come in. In your first project you will have full responsibility for designing and implementing a sales administration/stock control system for a newly formed Spares Division.

A competitive salary will be paid and major benefits include 4 weeks paid holiday, free life assurance, contributory superannuation scheme, assistance with removal expenses.

If you have relevant Analyst experience preceded by some programming – write to:

Roy Hill,  
D.P. Manager,  
Holman Brothers Limited,  
Camborne, Cornwall.

Telephone Camborne 2750.



A COMPAIR COMPANY

## London Boroughs' Joint Computer Committee

## SENIOR SYSTEMS ANALYST UP TO £2,500

The Joint Committee is a local authority set up to provide computer facilities for the London Boroughs of Bexley, Greenwich and Southwark.

An ICL System 4/70 will be installed at Greenwich in June 1971 to replace the existing LEO III.

Planned hardware and software enhancements will provide on-line information retrieval and subsequent real time processing facilities in all user departments.

An **ADDITIONAL SENIOR SYSTEMS ANALYST** is required to assist in the redesign of existing applications and the planning of new applications to achieve the planned objectives.

**Salary range £1,960–£2,535 per annum.**

Applicants should be trained analysts, preferably with Local Government experience.

**Application forms from Computer Manager, John Humphries House, Stockwell Street, Greenwich, S.E.10 (Tel. 01-858-7041) to be returned by 11th May, 1970.**

## FOR JOB SATISFACTION

Come to Argus Appointments. Many professionals do. Discuss your future with one of our qualified staff: we can offer you a wide range of senior posts between £2000 and £5000, or junior positions for those with potential. Years of successful computer personnel selection have earned us the confidence of leading organisations in the UK and Europe.

Please phone, call or return this, and let us do the rest.

NAME

ADDRESS

EXPERIENCE  YEARS FROG ☐ OP ☐ SYSTEMS ☐ OTHER ☐

## ARGUS APPOINTMENTS

Specialist Computer Personnel Appointments Service  
31 Kingly Street, London W1. 01-734 9767 (24 hours)



We have a wide selection of vacancies for experienced staff at all levels, salaries to £3,000

- Local Interviews—National Coverage
- Completely confidential service.
- Free Career Advice for Applicants.
- Highest ethical standards.

**BRISTOL 0272-24861** for West Country and South Wales

**BIRMINGHAM 021-643 9661 (10 lines) Midlands**

**LONDON 01-886 9201** for London and South.

**SOUTHAMPTON 0703-2548 South West.**

**CHELTENHAM 0242-24107** West Midlands.

or write to H.O., LCC, GROSVENOR HOUSE, 14 BENNETTS HILL, BIRMINGHAM 2,  
quoting Ref. DW/2.

LCC

**Lawden Computer Consultancy Ltd**  
Branches throughout the United Kingdom  
at any of your 30 local Lawden Employ-  
ment offices.

# So now we need more Visible Record Computer Programmers

**Terms:** up to £1,600 per annum plus luncheon vouchers.

Kienzle Data Systems Ltd.,  
202 Kensington Church Street,  
London W.8.

**KIENZLE** Data systems

required for large LEO III installation at Greenwich, S.E.10. Three-shift, 5-day rotating system to cover working week of 37½ hours. First-class conditions. Operators will be trained for System 4-70 tele-processing systems. **Salary, subject to experience, within Scale £1,010 to £1,435 per annum plus 15% shift allowance on basic pay.**

Application forms from the Computer Manager, John Humphries House, Stockwell Street, Greenwich, S.E.10.

Applications are invited from suitably qualified persons for two posts of:

**Salary Scale—A & P 'F'—£1,940-£2,185**

in the Treasurer's Department, County Buildings, Hamilton.

The successful candidates will be required to lead a team in the programming and development of applications using an IBM 360/30 Tape/Disk system.

Programs for Payrolls, financial ledger, costing, valuation, rating, highways design are fully operational and assistance is also being given to other departments, e.g. Housing and Planning. In the immediate future programming will commence for Property Revaluation and also for decentralisation. The extension of the computer service to other departments of the County Council will continue and will provide an opportunity for the successful candidate to make a contribution in a wide variety of interesting projects.

**MORTGAGE AVAILABLE—or HOUSING ACCOMMODATION; REMOVAL EXPENSES SCHEME; 5 DAY WEEK; STAFF RESTAURANT.**

Application forms from the undersigned should be returned by 15th May, 1970.

County Buildings,  
HAMILTON.

**TELFORD** NEW TOWN  
for people on the move

## SYSTEMS ANALYST/ PROGRAMMER

**£1,345 to £1,575 or  
£1,575 to £1,800**

An experienced programmer wishing to move into systems analysis is required. This is a first-class opportunity to work in a new small team and gain valuable and varied experience. Emphasis will be on systems work but knowledge of low and medium level languages is desirable. A G.E.I.S. 115 with 2 mag discs will be installed shortly.

Housing, training and generous allowances.

Applications, giving two referees, to the Secretary, Telford Development Corporation, Priorslee Hall, Telford, Salop. by 13th May 1970.

# LEO

## PROGRAMMERS

**WE REQUIRE:** PROGRAMMERS WITH AT LEAST 12 MONTHS' EXPERIENCE USING CLEO AND/OR INTERCODE  
STARTING SALARY: £1,250-£1,700.

**WE ARE:** ONE OF THE LARGEST JOBBERS ON  
THE LONDON STOCK EXCHANGE.

**WE HAVE:** A 32K LEO III, P/T IN & OUT,  
7 MT DECKS. AND LINE PRINTER.

**WE OFFER:** OPPORTUNITIES TO GAIN GOOD COMMERCIAL EXPERIENCE AND PROGRESSION TO A LARGE 1900 SERIES WITH DISCS.

**APPLY FOR APPLICATION FORM:**

1. BY PHONE 01-628 8080 EXT. 498
2. WRITE TO: M. J. BROOKE ESQ.,

**WEDD DURLACHER MORDAUNT & CO., AUSTRAL  
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## Experienced Programmers

**api**

£2,000 to £3,000

54 U.K., U.S.A. and European Companies will be interviewing experienced Programmers at API's exclusive interviewing and conference room facilities during the month of May following the recently conducted DATA DECADE Computer Industry Conference. Important business opportunities exist for those possessing the qualifications listed below:

**INSTALLATIONS:** IBM, ICL, BURROUGHS, UNIVAC, NCR, HONEYWELL.

**LANGUAGES:** COBOL, PL/1, FORTRAN, ASSEMBLER, PLAN.

**APPLICATIONS:** Commercial, Financial, MIS, Cost Control, Production Control, Planning, Communications, Real Time, PERT, O & M.

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To arrange *your* series of interviews, write or call now and cite reference INT/400.

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API INTERNATIONAL · 133, OXFORD STREET, W.1.

### P. D. COMPUTER SERVICES

require a

## SOFTWARE SUPPORT PROGRAMMER

For their South Wales Computer Centre.

The person appointed will be responsible to the Computer Manager for the maintenance of all User Programs, Standard Software and Packages currently being developed on a Honeywell 125 Disk/Tape configuration. The position carries a high degree of responsibility and it is unlikely that the successful applicant will have less than two years' programming experience using Cobol and an Assembler language. Preference will be given to applicants with a Honeywell 200 background.

The salary will be commensurate with the importance of this key position and assistance will be given with re-location expenses if necessary.

Applications should be sent to:

**B. C. PAYNE—COMPUTER MANAGER  
P.D. COMPUTER CENTRE  
THE ENGINEERING WORKS  
RHYMNEY, MON.**



**Powell Duffryn**

## is your manager a computing professional?

We believe that the true professional often prefers to work in the company of other professionals at all levels. Especially if he is keen to sharpen his skills and to obtain a complete career.

Hence CAP is to software what a legal firm is to law or accountants to accountancy. Our management are themselves specialists and responsible to the staff who own the entire company.

The variety of work here is tremendous, from Commercial batch to terminal orientated real time. We serve governments, banks, manufacturers, scientific establishments and a host of other users. For this purpose we need a wide range of specialists and technical managers.

CAP has always been profitable and is growing at about 40% per year. Thus earnings and prospects are excellent. But standards are high since you will be judged by your colleagues. Promotion is available up to partnership status including individual share-owning.

Few seniors choose to leave us. Perhaps you would like to find out why. We are specially interested in applicants in London, Glasgow and Reading for:

### CONSULTANTS (SALARY TO £4000)

Minimum of 5 years sound and varied computer experience needed; including considerable experience of close-in supervision of implementation projects. Proven ability to negotiate with users in a professional way is highly desirable. (Ref. DW 1021)

### SENIOR PROGRAMMERS (SALARY TO £3000)

At least 3 years good implementation experience is essential. This must include personal knowledge of high and low level languages, as well as successful operation as a team leader. (Ref. DW 1022)

Please apply, quoting the relevant reference:  
by telephone to G. J. Elliott 01-242 0021 (24-hour answering service) or by letter to the address below.

# CAP

Computer Analysts & Programmers Limited,  
CAP House, 14/15 Great James Street, London, W.C.1.

London, Glasgow, Manchester, Reading,  
Paris, Amsterdam, Brussels, Dusseldorf, Geneva.





## EXPERIENCED PROGRAMMERS

Whitbread & Company Ltd., are installing a number of Honeywell 110's and 125's throughout the country and a tape and disc Honeywell 1200 in central London.

Existing sales accounting programmes are being extended nationally and there are plans for new applications in the fields of stock control, budgetary control and forecasting, and share registration.

To implement these projects additional experienced programmers preferably with a knowledge of Easycode and COBOL are required. Successful applicants will be based on group headquarters in central London and can expect initially to earn not less than £1,800 p.a. This is an expanding situation with good opportunities for advancement.

Applications should be addressed to the Computer Applications Manager, Whitbread and Company Ltd., The Brewery, Chiswell Street, London, E.C.1 or Telephone 01-606 4455 Extn. 588.

## Science Research Council

Rutherford Laboratory

Chilton, Didcot, Berks.

## Computer Operations

The Rutherford Laboratory needs young men with GCE 'O' level in English Language and a mathematical or scientific subject plus two other acceptable subjects, to be trained as computer operators. They will be appointed as Scientific Assistants and encouragement will be given for further education and training enabling candidates to qualify for promotion and to be employed as Deputy/Shift Leaders. They will also be expected to acquire some practical knowledge of programming.

Machine: IBM System 360/75 (J) with multiple satellites.

Language: Mainly Fortran.

Salary: Age scale giving for example £580 (age 18), £710 (age 20) rising to a maximum of £1,240 p.a. This salary is currently under review.

Shift allowance: 12%-20% of salary according to shift rota.

Superannuation: Contributory.

Facilities: Daily travel, restaurant, shopping, sports, hostel, day release.

Please send a postcard for application form to Mr. P. B. Nichols, The Rutherford Laboratory, Chilton, Didcot, Berks., quoting reference 184/532. Closing date 13 May.

## WANTED

## EXPERIENCED PROGRAMMERS

to join a new firm

of consultants

in

TUNBRIDGE WELLS

## REWARDS FIRST-CLASS

Telephone or write to:

**Arthur Chopping,**  
**Metropolitan Computer Services Ltd.**  
**5th Floor,**  
**Haymarket House,**  
**28 Haymarket,**  
**London S.W.1.**  
**01-839 7411**

## CONSULTANT PROGRAMMING MANAGERS

Urwick Dynamics Limited, formerly Urwick Diebold Limited, is the computer division of Urwick, Orr & Partners Limited, International Management Consultants. We are urgently seeking a number of experienced programming managers to lead implementation projects in client situations. Applicants should have had several years programming experience, gained on at least two machines, including a considerable time spent in management.

Financial rewards are high and are geared to individual performance. Starting salaries are related to prior accomplishment and will be up to £3,000 (plus profit share). There will be opportunities to transfer later to

management consultancy with considerably higher reward.

The Company operates a generous contributory pension scheme and also provides for life assurance and private medical cover.

Rates of remuneration are constantly reviewed to ensure that Urwick Dynamics attracts and keeps the highest calibre staff to match the demands of management consultancy, a 20th Century Profession.

For an application form please write or telephone J. A. Tryon, Urwick Dynamics Limited, St. Andrew's House, 40 Broadway, London S.W.1 (telephone 01-839 2487) quoting reference 408/D

### DOES SELLING COMPUTERS

and earning £2,300/£6,000 interest you? Successful extrovert Systems Analyst, 25/35? Sales Search, 22 Beauchamp Place, S.W.3. Tel.: 589 3722.

### WATFORD COLLEGE OF TECHNOLOGY

Hempstead Road, Watford, WD1 3EZ.

Applications are invited for the post of

### SENIOR LECTURER IN COMPUTER STUDIES

from 1st September, 1970.

Salary: £2,417-£2,752.

Application forms and details may be obtained from the Registrar.

 **Urwick Dynamics Limited** 40 Broadway, London SW1



# Analysts . . . would you like to work on virgin soil?

Our clients have offices in Feltham and Central London and have a 360/30 with disks and tapes.

They have just started work in London on a Company that has never seen a computer and which has vast scope for EDP. If the idea of using your abilities to introduce advanced techniques (V.D.U.s for remote order entry?) in a publishing/mail order environment appeals to you, and you are currently earning around £2000, we would like to hear from you.

Prospects with our clients are excellent for the right people; so are the possibilities of upwards progression into general management into other parts of the group on a realistic time scale.

Ref. DW 1775

To apply telephone 01-839 6155 (24 hours) or write to ASAP, 11 Waterloo Place, London, S.W.1. Nothing will be disclosed to our clients without your permission.

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## BATH UNIVERSITY OF TECHNOLOGY

### Computer Unit

Applications are invited for the post of

### SHIFT LEADER

This is a new post due to the introduction of two shift operation. Applicants should be experienced operators and be qualified to G.C.E. advanced level. Experience of System 4 is desirable.

Salary scale (currently under review) £1,000-£1,300 + shift allowance. Super-annuable post.

Application forms obtainable from Registrar (S), The University, Claverton Down, Bath, BA2 7AY, quoting reference 70/22.

Oxford Circus

## PROGRAMMER/ ANALYST

£1750—£2250

An assembler Programmer with knowledge of Systems Analysis and Design is required by West End Computer Bureau Limited, an independent Bureau recently established by a firm of Chartered Accountants, to take a leading role in their team using a comprehensive Burroughs E8000 Visible Record Computer configuration.

Applicants should be able to deal with clients, work on their own initiative, and must have had at least 18 months' programming experience preferably in a visible record environment. Training will be given in Burroughs E8000 programming.

This is an excellent opportunity to take advantage of the exciting and varied work that only a bureau can offer. Applications in writing to M. E. Orford, Bowker Orford & Co., Chartered Accountants, 15/19, Cavendish Place, London, W.1.

## Check in New York -via Boadicea in London



## Programmers

Four cancellations. Twelve new bookings. All at the last minute. No problem to BOADICEA - the world's most advanced real-time computer installation - the only system able to handle 3 or 4 major real-time applications simultaneously.

It can check in passengers at airports, load aircraft, prepare flight plans and handle global reservations. All at once, and in seconds!

We've other exciting plans for BOADICEA, including links with other airlines computers, travel agent systems and hotel reservations.

To help us develop these ideas we urgently need more PROGRAMMERS - profession-

als with at least two years' experience, who are interested in meeting the demands of the 747 and Supersonic air travel.

Come along and join us at BOADICEA. Salaries rising to £2898 per annum (including London Weighting), and there are also facilities for holiday air travel.

Write telling us all about yourself to: Manager Selection Services (DW 300), BOAC, P.O. Box 10, Heathrow Airport—London Hounslow, Middlesex





# Put yourself first

First in the field of real-time commercial bureau services, and first in your own career, by joining our multi-access customer installation team in London or Manchester.

Our real-time system has been designed and developed to provide an integrated, comprehensive, commercial service, which will raise eyebrows even among computer sophisticates. Your job will be to provide the post-sales systems support which ensures that the customer is able to benefit from the facilities, to guide and assist him in every phase of implementation.

Commercial programming/systems experience is essential, plus the organising ability required to get the best out of the system for the mutual benefit of the customer and the company. A full training in the system and customer-installation techniques will be given.

If you are the man we are looking for, you must already be aware of the development potential of real-time commercial computing—so you can take the career prospects as read.

Write giving details of age, qualifications and experience, and quoting reference CW2361 to D. N. McAlister, International Computing Services Limited, 68/71 Newman Street., London W1.

**A company of the  
International Computers Group**

**ICSL**

# Systems Programmers

£3,180 +

RST has vacancies for Systems Programmers at Ndola on the Copperbelt of Zambia, the site of the Central Office for four mines managed by RST and owned in partnership with the Zambian Government.

At Ndola an IBM Systems 360 Model 40 configuration is employed for the processing of commercial and technical systems. The configuration operates under OS-MFT II and consists of 256K core storage, 2314 direct access storage, a 1627 graph plotter and standard input and output peripherals. It is planned to instal a second Model 40 in June which will operate under DOS and will be used primarily to process STAMPEDE, on-line tele-processing links and to emulate a major commercial system currently processed on an ICL configuration.

## Systems Programmer (OS)

## Systems Programmer (DOS)

Systems Programmers will be employed in the Systems Support Section, which is responsible for all aspects of OS, including preparation of standards, implementation of all IRM packages, preparation/implementation of RST utilities and R & D in respect of future requirements. The Systems Programmer (DOS) will have ample opportunities at a later date to be trained and become involved in OS activities and preference will be given to applicants who have TP and/or graph plotting experience.

**Candidates for both positions must have a minimum of six months practical experience as systems programmers in a multi-programming environment.** Employment will be on contract, initially for a period of three years. Total emoluments on starting will be paid in local currency equivalent to not less than £3,180 p.a. Exchange control allows contract employees to externalise 50% of monthly earnings.

### Additional Benefits

These include • return passages • baggage allowance • housing with basic furniture at low rental • medical aid and free life assurance schemes • six weeks paid leave p.a. Living and working conditions are good in a healthy, temperate climate and there are excellent facilities for sporting and leisure activities.

*Write or telephone for an application form to:*

*The Manager, 69/70, Overseas Appointments Division,  
RST International Metals Limited, One Noble Street, London EC2  
Telephone: 01-606 8800 Ext. 307*

**RST** 

**ASAP**

**COMPUTING**

## Development Analyst

c. £2500

This is a unique opportunity for a Systems Analyst with at least 2 years manufacturing systems experience to play a creative and influential role in a large IBM/360 installation. The man appointed must be able to communicate effectively both orally and in writing with user and computer management providing practical proposals for the development of a broad based information system taking full account of the latest developments in hardware and software. The company is a leader in the D.P. field and for a man with the ability and personality to take a broad overview of the computer and its function with the organisation, this position offers excellent career prospects.

Ref. DW 1776

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### UNIVERSITY COLLEGE LONDON COMPUTER CENTRE

The Centre operates a large IBM 360/65 installation on which it provides a computing service for University College and the rest of London University. It is now proposed to establish a User Services Group to co-ordinate the advisory, training and information services which are available to users. Applications are accordingly invited for the post of:

**HEAD OF USER SERVICES GROUP**  
Candidates (male or female) should have a degree, or equivalent qualification, several years experience of large-scale scientific computing and administrative ability. The starting date for this new post is 1 August 1970 or as soon as possible thereafter. It is hoped to make the appointment on the Group Leader scale £1,815 × £115-£2,850 plus £60 London Allowance (scale currently under review), with participation in the F.S.S.U. scheme for superannuation. Initial placing will depend on experience.

Applications (3 copies) giving experience and the names of three referees, should be sent to Dr. P. A. Samet, Computer Director, University College London, 19 Gordon St., W.C.1, before Friday, 22 May 1970.



## COMPUTER PERSONNEL

52 SHAFTESBURY  
AVENUE  
LONDON, W1  
01-437 5266

We continue to maintain a specialised personnel service for computer professionals of all grades.

### Salary ranges

Systems Analysts	£2,000-£3,500
Analyst/ Programmers	£2,000-£3,000
Programmer/ Analysts	£1,500-£2,250
Chief Programmers	£2,250-£3,000
Senior Programmers	£1,800-£2,250
Programmers	£1,250-£1,750
Operations Managers	£1,800-£2,500
Operations Supervisors	£1,500-£2,000
Chief Operators	
Shift Leaders	£1,300-£1,800
Operators	£1,000-£1,650
Punch Operators	£750-£1,250

RING NOW FOR IMMEDIATE PERSONAL ATTENTION TO BRING YOU A CHOICE OF GOOD JOBS.



## CHIEF SYSTEMS ANALYST *up to £3,500*

Whitbread management services department, based in Central London, is co-ordinating the development of the company's commercial and business systems on a national basis.

The associated hardware commitment, which approaches £500,000, includes a central disk and tape Honeywell 1200 supported by a number of Honeywell 110 and 125 computers located in the member companies of the organisation.

The first stage of the development project is now being written and must be implemented nationally before Decimalisation Day. To manage the successful completion of this phase and to initiate and control the development of subsequent stages, our

clients require a dynamic Chief Systems Analyst. He will report to the Computer Applications Manager and will control a team of Systems Analysts working on a wide range of complex applications. The man appointed will have had at least 3 years' experience of commercial systems design and implementation, and will have the skill and ability necessary to lead and motivate a team.

*Please write or telephone for an application form to Michael Williams, Urwick Dynamics Limited, St. Andrew's House, 40 Broadway, London S.W.1. (telephone 01-839 2487) quoting reference 407/D*

**Urwick Dynamics Limited** 40 Broadway, London SW1

## Matthew Hall

We are a leading construction engineering group contracting to a wide variety of industries including Petrochemicals, Civil Engineering and Mechanical Services, whose design and administrative headquarters are situated in Central London. Our Computer Department operates an ICL 1900 series machine and further opportunities exist for a Systems Analyst and a Programmer to join our computer staff who are engaged on technical and commercial projects.

### SYSTEMS ANALYST

This is an excellent opportunity for a young Systems Analyst who has had previous systems design and preferably some programming experience. He should possess a good knowledge of ICL 1900 equipment and be able to show evidence of having successfully implemented projects.

### PROGRAMMER

It is essential for applicants to have a good knowledge of 'PLAN' and 'COBOL' and preferably at least twelve months' programming experience.

Generous competitive salaries will be offered to the successful candidates together with attractive fringe benefits usually offered by a large company, including a staff bonus scheme.

Written applications should be sent, in complete confidence, giving brief details of age, education and experience, to:

Staff Personnel Officer  
Matthew Hall & Company Limited  
Matthew Hall House  
101-108 Tottenham Court Road  
London, W1A 1BT

## PROGRAMMERS !

**Big new clients  
appoint  
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exciting new  
opportunities**

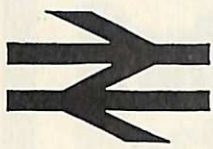
### Phone or write NOW

Estelle Mendoza, 11-13 Melton St., London N.W.1  
Tel: 01-387 8013 OR

Norma Byrne, Peter House, Oxford St., Manchester  
Tel: 061-228 1691

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# COMPUTER AIDED DESIGN

*Expansion brings new opportunities  
in railway engineering*

## ENGINEERS: MATHEMATICIANS: SOFTWARE SPECIALISTS

There are opportunities at varying levels in the Research Department, Derby, for men and women to: develop software and applications programs: work jointly with users on production jobs.

### Equipment

The Engineering Mathematics Section intends to use an Elliott 905/928 visual display system and Ferranti automatic draughting equipment to explore C.A.D. possibilities jointly with British Rail design and manufacturing organisations. The Elliott 905 computer will act as a satellite of the main in-house computer, an IBM 360/44 with 384 Kb store. The present and proposed activities of the two groups of the Section are:

### ■ COMPUTER APPLICATIONS GROUP

#### Structural analysis

- ☐ Development of programs for analysis of time dependent systems
- ☐ Enhancements to existing finite element programs and conversion to interactive graphics operation
- ☐ Minimum weight optimisation

#### Design Systems

- ☐ Geometric layout problems
- ☐ Programs in conversational mode
- ☐ Use of computers in drawing production and procedures
- ☐ Computer part-programming and use of

graphics for numerically controlled machines

- ☐ Use of production programs in the design of a variety of structures ranging from vehicles or components to skew or box-girder bridges.

### ■ APPLIED MATHEMATICS GROUP

#### C.A.D. systems

- ☐ Maintenance and modification of Elliott and Ferranti systems software and applications programs
- ☐ Implementation of communications package to interface Elliott 905 with the main computer in collaboration with the IBM 360/44 bureau systems group
- ☐ Software packages for graphics applications involving data banks and information retrieval.

#### Railway Systems

- ☐ Optimisation and simulation work on complex mathematical models for:
  - energy forecasts
  - minimisation of energy consumption
  - econometric studies
- ☐ Implementation of large data banks for train, traffic and engineering information.

There are opportunities in all these activities; we would particularly like to hear, at this stage in the C.A.D. work, from mathematicians or software specialists with experience of IBM systems or relevant Elliott software and from engineers with experience of part-programming techniques or of structural design using computers. For the senior jobs, applicants must have relevant experience; there are other posts for which recent or prospective graduates would be suitable.

Salaries are in ranges varying from £1255-£1795 (plus £50 degree allowance) up to £3095-£3770. The job location is in the Railway Technical Centre at Derby which houses the research and the vehicle design and production organisations of British Rail. The Board operates a contributory pension scheme and has arrangements with many employers for the preservation of pensions. It also gives assistance in some cases with removal expenses. There are free and reduced rate rail travel facilities.

People who would like more detailed information before applying are welcome to telephone or write to: Peter West, Assistant Director, Engineering Research Division, B.R. Technical Centre, London Road, Derby. (Derby 49203, ext. 241).

Applications stating age, education, qualifications, experience and present salary should be sent to the **Headquarters Staff Manager** (quoting reference RB.84/KF), British Railways Board, 222 Marylebone Road, London, N.W.1.

# ASAP

COMPUTING

## Analysts

If you have approximately 18 months programming experience prior to analysing and implementing at least one system OR a minimum of 2 years systems analysis, and you can radiate some of your own enthusiasm to user departments then we can offer you a position in an international group with a CENTRAL LONDON location.

They have developed a package which is being run as a pilot project for one site and feasibility studies for take-on of other centres will need to be carried out. This will involve some travelling within the U.K. The changes necessary for the introduction of on-line teleprocessing also need to be considered.

This company offers unlimited promotion prospects to anyone with the necessary ability and starting salaries of up to £2400.

Ref. DW 1773

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## THE UNIVERSITY OF ASTON IN BIRMINGHAM

### COMPUTER CENTRE

The Computer Centre is equipped with an ICL 1905 tape and disc system which is currently running under the GEORGE 2 Operating System. Due to expansion of demand, additional staff positions are being established. Applications are invited for the following posts:

Senior Programmer, salary £1,585-£2,275  
Programmer, salary £1,091-£1,565  
Operator Grade I, salary £821-£1,091  
(+Shift Allowance)  
Operator Grade II, salary £568-£851  
(+Shift Allowance)

The Centre operates a service to the Administration as well as the Academic Departments of the University. Languages currently used are Algol, Cobol, Fortran and Plan.

The Senior Programmer position will be concerned with the commercial aspect of programming (although scientific programming will not be ignored) and the Programmer position would be for either aspect.

The Operator positions are to enable the computer to be operated on a two-shift basis commencing in July of this year.

Further particulars and application forms from the Staff Officer, The University of Aston in Birmingham, Gosta Green, Birmingham 4, quoting reference 0/784/DW.

# SYSTEMS ANALYSTS

**Salaries up to £2,250**

A rapidly expanding distribution organisation based in Morden, Surrey, is now installing a disk based IBM 360 computer.

A totally integrated financial and management accounting system incorporating visual display units is now being designed.

The staff complement must now be increased by

## 2. SYSTEMS ANALYSTS

Applicants should have had at least 2 years' of commercial computer experience as programmers or analysts. These positions could well suit experienced programmers seeking a move to systems analysis. Ideally applicants should have worked in a disk environment on IBM, ICL or Univac equipment.

Phone Chief Systems Analyst at 01-540 3831  
or write to Box Number DW 350.

# Program, programmer, programmest- Operating systems origination

In GEORGE 3 we have one of the most advanced operating systems in the world. It follows that when we're looking for more programmers to help implement a planned series of enhancements, we expect applications only from people who look forward to more in their work than Friday afternoon.

Job satisfaction is the big attraction of working on a project like GEORGE 3—and we pay

realistic salaries because we want talent. Partly, this enjoyment comes from being at the centre of things, developing a system which will have a profound influence on computing all over the world.

Partly it's the same kind of fulfilment an artist gets—the gratification of stretching creative abilities on something original, something no one else has done before. At the moment we're breaking new ground in multi-access systems for conversational programming, scheduling, file-store organisation, paging, and other facilities designed to keep GEORGE 3 ahead of the rest.

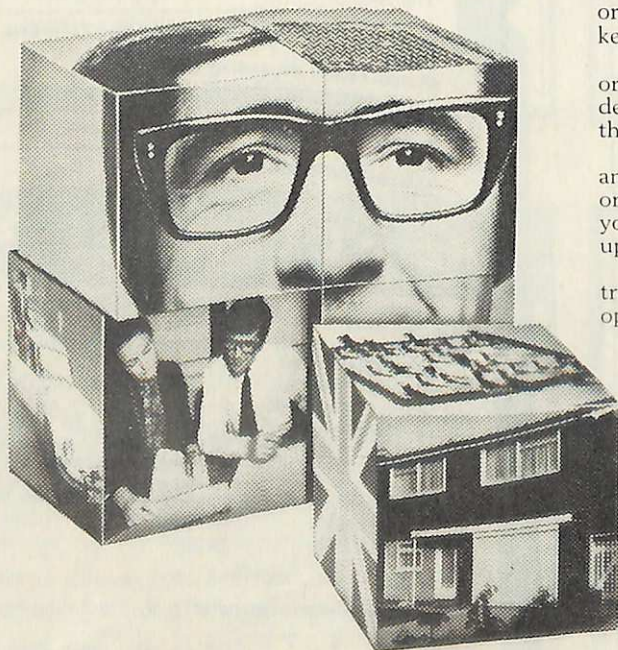
As we complete more and more additions to the original concept, so new possibilities emerge. Future development is thus not altogether cut and dried—there's still scope for pioneering influence.

So, if you have a couple of years' experience, and you either have an interest in operating systems or you've had some experience with them, and you're ready to have your programming ideas woken up by the challenge of originality, please get in touch.

Join the people who anticipate and set the trends—Europe's most significant software operation.

Location: Putney, London SW15.

Please write or 'phone for an application form, quoting reference no. 323S to Mr. W. D. Camidge, Personnel Officer, International Computers Limited, 85-91 Upper Richmond Road, Putney, London SW15. Telephone: 01-788 7272, ext. 4224.



**International  
Computers**





A career challenge for

## SENIOR PROGRAMMERS

Up to £2500

We are manufacturers of heating fluid control and water treatment equipment. We are shortly taking delivery of an IBM 360/30 with 2314's and tapes at our new London Computer Centre. Due to the rapid expansion of our Systems Services function we require qualified men to make a vital contribution to the implementation of an integrated inventory management and production planning system.

Excellent opportunities thus arise for programmers with a minimum of 2 years experience of working in assembler language and/or COBOL (under DOS) to join our progressive team working on these applications.

Employee benefits include 4 weeks holiday, immediate life cover, L.V's. and re-location assistance where appropriate.

For further details telephone Paul Kibbey, Personnel Manager (01-353 6511 Ext 291) or write to him with all relevant career details at Crane Limited, 15 Red Lion Ct., Fleet Street, E.C.4.

**CRANE**

**WILLIAMS HUDSON LIMITED**

(a diversified group with a turnover in excess of 35 million pounds)

## SYSTEMS ANALYSTS PROGRAMMERS

We took delivery of our 1901 16K tape configuration last September at our head office and are computerising sales, purchasing and stock recording systems.

This is to be followed by control data on one of our fleets of over 350 vehicles.

This is an opportunity to be creative in your work and join a group where your experience will be realistically rewarded in terms of job satisfaction and salary.

Write in confidence to:

**The Data Processing Manager,  
Williams Hudson Limited  
8 Lloyds Avenue,  
LONDON, E.C.3.**

**MSL**

Management Consultants  
in Human Resources  
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## Computer Software Consultancy Potential Director about £5000

for one of the top six software houses. They have achieved their reputation in the UK and Europe over the last eight years by a controlled growth with the emphasis on extremely high professional standards. The company is self financing and fees are increasing at 35%-40% per annum. In 1971 the senior consultant who has set up their Scottish operation will return to London and a planned vacancy now occurs for a man to join him as Assistant Manager. During 1970 he will share the technical, operational and marketing work of the manager and will assume full responsibility for the area next year. He will later become a Director of the local company. Candidates must have a minimum of five years' progressive experience of programming and systems design together with at least two years' project management amongst professional consultancy staff. Free pension, life assurance and sickness scheme; bonus. Share ownership scheme later. Relocation expenses to Scotland. J. C. Day reference KF.1288.



The MSL Consultant has analysed this appointment

Further information will be sent if you provide your name and address by telephoning 01-629 1844 or writing to the consultant quoting the reference. Your enquiry will be in confidence.

Midas are retained to find a number of professional computer people who want to develop their careers.



## PROGRAMMERS

The Midas Touch

### COMMERCIAL/SOFTWARE PROGRAMMERS

Middx

£1,300-£3,000 depending on experience.

A commercial user requires programmers from 6 months' experience upwards with COBOL and/or System 4 usercode. Applications—batch processing and on-line.

### SENIOR PROGRAMMER

City

£1,700-£2,000

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of Dataweek are:



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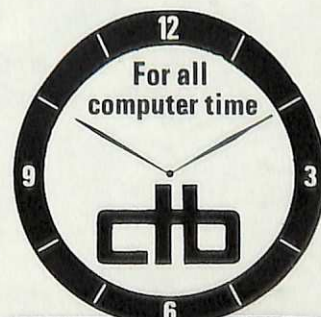
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