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COMPUTER WEEKLY

Number 100

Thursday, 15 August, 1968

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System 4 wins over IBM customers

Hospital Board favours 1904 system

PLANS for Sheffield Regional Hospital Board computer centre are now well advanced and a new building to house the computer system is scheduled to be completed by early 1970.

In preparation for the development of computer operations, the hospital board have ordered eight Kode UKPV72 data preparation units. At present these are to be installed at the National Coal Board's headquarters in Doncaster and will be jointly used by the NCB and the hospital board.

The UKPV72 is a paper tape punching unit and the Sheffield machines will be used initially to handle payroll data. Later, accounting routines, stock control, patient and bed statistics, including diagnostic indices, will be added.

The computer for the centre has not yet been finally decided, but three machines are being considered with it is understood, an ICL 1904, the most favoured. The configuration is expected to have 32K of core store, four magnetic tapes, two or three discs, paper tape and card input and line printer output.

Time Sharing unit in bureau office

THE first franchise agreement between Time Sharing Ltd and an independent operator has been signed with Northern Computer Bureau of Leeds. The terminal at NCB's office in Leeds will be available to users in the West Riding of Yorkshire, Leeds and Sheffield areas and the bureau will supply technical support facilities in the scientific and engineering areas.

New facilities for Friden 5610

THREE new facilities have been added to Friden's 5610 Computer invoicing machine. The machine is now supplied with a front feed carriage and a split paten, which enable the operator to work on statement, ledger card and journal at the same time, or on ledger posting and invoicing.

COMPATABILITY with IBM's 360 series has been a key factor in ICL gaining two further orders for their System 4 range. Announcement of the orders came within days of Arthur Humphreys, managing director of ICL, stating that "We shall use the System 4 for our attacks on IBM users" when defining ICL market strategy in Edinburgh last week.

The orders are for a System 4/30 for Somervell Brothers Ltd, of Kendal, Westmorland, makers of the "K" range of shoes, where it will replace a System 360/20, and for the Northern Gas Board who have ordered a system 4/70 to extend their existing 360/30 instal-

lation. Eventually the 360/30 will be used as an input/output processor for the 4/70.

In both cases demonstrations of compatibility were called for by the customers and satisfactorily carried out by ICL. This was in addition to cost performance advantages which showed the System 4 machines to be cheaper than the alternatives.

The System 4/30 for Somervell's will have 65K bytes of store, tape and disc facilities, and will process the existing work load in one third the time taken by the present installation. The extra capacity will be used to expand and upgrade the existing stock control and invoicing procedures, and to introduce new applications, including production control and purchases of raw materials. Cost of the installation is £165,000 and delivery is scheduled for next February.

Work alongside

The Northern Gas Board's System 4/70 is valued at £566,000 and due for delivery at Norgas House, Killingworth, Newcastle upon Tyne in October, 1969. It will work alongside the existing IBM 360/30. Initially it will be used to take the load off the 360/30 which is currently on three shifts, later it is planned to use the 360/30 as an input/output processor to the 4/70.

The 4/70 will have 196K bytes of store, a 600 megabyte disc, and a mixed tape and disc and a mixed magnetic tape disc configuration. A multi-channel communications controller and three video terminals are included in the order.

FIRST STAGE OF BIRDS EYE NETWORK

THE world's largest producers of frozen food, Birds Eye, who carry over 70 product-lines and have 45 UK depots, have installed an STC GH-210 data communication system, marking the initial stage of a sophisticated network which will eventually provide management with instant production and marketing information.

The system, which incorporates automatic error detection and correction and provides an automatic remote operation facility to improve line utilisation by an estimated 66 per cent, will connect the company's Walton-on-Thames head office with the computer centre and plants and depots, operating at a speed of 1,200 bps.

To offset initial costs ordinary message traffic will also be switched into it and a computer-compatible eight-level transmission code will be standardised throughout the company in support.



Northern Stock Exchange plans on-line network

A FULL client and broker accounting service is to be set up by the Northern Stock Exchange, using bureau facilities provided by International Computing Services Ltd. The ICL 1905 run by ICS in Manchester, and British Olivetti TC 349SE terminals will be used to produce clients' contracts daily in five centres, Leeds, Liverpool, Manchester, Newcastle upon Tyne and Sheffield.

Software package for 4130 users

A NEW software package, known as a Timesharing Monitor (TSM), has been developed for users of large ICL 4130 systems. The monitor will permit users to time share an independent processing system, such as graphic display, with batch processed jobs.

The monitor will automatically exploit any processor time available after giving necessary priority over jobs running under the T30C operating systems or other off-line systems. The monitor is only suitable for 4130 configurations with at least 64K store.

1901 to go to Chiswick

THE Chiswick-based engineers, Evershed and Vignoles, have placed an order with ICL for an 8K 1901 machine with four cassette tapes, a card reader and line printer, for delivery next May. The company intends to use the machine initially for commercial applications and later for production control.

Just released in the UK, the NCR 400 electronic accounting machine, pictured above, combines magnetic ledger facilities with magnetic disc storage and punched tape programming to offer increased speed and efficiency over previous models. Reading instructions punched into a loop of Mylar tape instead of the usual plugboards and mechanical programming devices makes it unnecessary for the machine to resort to picking up each new instruction by performing a mechanical cycle and reduces error possibilities by making the operator follow a pre-determined sequence. Due to its logic structure and flexible printer the machine, which is now in UK production at NCR's Dundee factory, will need no mechanical conversion.

Divisions merge at English Electric

BY amalgamating their Industrial Control and Automation Divisions at Kidsgrove, Staffs, English Electric has launched an Industrial Process and Control Division under the management of Mr Alan Mills.

The new division, which starts with orders worth several million pounds, will cover process instrumentation, telemetric work, control and automation functions and industrial drive systems for the oil chemical, paper and rubber industries.

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OPINION

VALUE FOR MONEY AT IFIP

DEDUCING the cost of sending a delegate to attend IFIP is a task worthy of a computer. The distances they travelled, the cost of accommodation, the salaries, the overheads and the value of time not available to their usual tasks. All of these are variable but a modest estimate would appear to be about £250 for each delegate. On this basis it cost the computer community about £900,000 to support IFIP in Edinburgh. A remarkable sum, which would be sufficient to buy a large scale computer, or endow a modest research centre.

What have the delegates, as representatives of the industry, gained for this investment? There is a weighty set of lecture notes which will provide ample winter reading material but which will be rapidly dated, there was a compact, but representative exhibition where several local systems were in operation and an extensive range of equipment was on show, and, in addition to the main conference, there were many private presentations.

Most important of all, though, was the opportunity, avidly taken, to talk to other

computer men from all countries and all levels. It only needs for a fraction of the ideas discussed late at night in hotel bars, the plans and schemes hatched in the sun in Princes Street Gardens, or the philosophies expounded in quiet corners everywhere, to be implemented for the cost to have been well worthwhile. Let us hope that not all the discussions that went on during those few hectic days in Scotland will not prove to be just a rush of hot air to be dissipated by bureaucracy or smothered by the inertia of authority.

COMPUTER WEEKLY

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THIS WEEK

- Myriads will be base of
message switching system 2
- People in the news 2
- Diary Dates 2
- Product Notebook 3
- STEPMA — a simulator for
tele-processing and
multi-access, by Prof
F. G. Heath 6/7
- Courses 7
- IFIP Congress review 8/9
- Computer graphics sympo-
sium at Brunel University 10

Meeting in St Louis

MORE than 2,500 management
systems and DP personnel from
the US and overseas are expected
to attend the 1968 International
Systems Meeting in St Louis from
October 20 to 23.

Sponsored by Systems and Pro-
cedures Association, the ISM will
be held at the Chase-Park Plaza
Hotel.

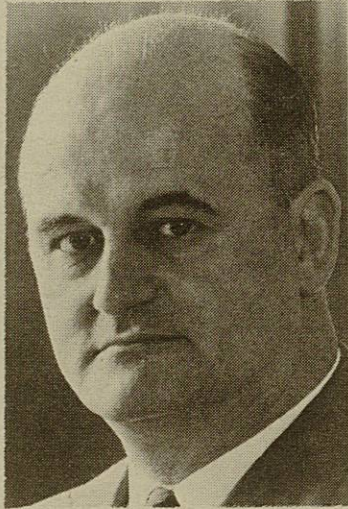
PEOPLE

THE posts of president of the US owned Farrington International and managing director of Adrema Ltd have been filled with the appointment of Mr O. C. BOXALL who retains his position as executive vice president of Farrington Manufacturing Co.

Mr Boxall joined Adrema as a sales representative in 1950 and in 1955 he became manager of the Birmingham branch. Three years later he was appointed the company's representative in Canada.

Following its acquisition of Adrema in 1960, Farrington Manufacturing Co, Mr Boxall was recalled to the UK and soon appointed general sales manager. He transferred to the US to handle the marketing side of Farrington Manufacturing and in 1966 was appointed president of the US domestic operating subsidiaries.

He then became executive vice-president and director of Farrington Manufacturing and joint managing director of Adrema.



BOXALL

Mr J. Waddell has been appointed manager of computer development with the Gallaher group of tobacco companies and Mr J. M. Holland has been made assistant manager of computer development. Since 1961, when Mr Waddell joined Cooper Bros, he has been involved in many assignments, including the selection and improving of computers and their installation.

Three other appointments, all as computer project managers, in Gallaher's development are: Mr J. W. Bell (production); Mr R. S. Keating (distribution); and Mr E. F. G. Munt (sales and marketing).

Mr K. J. Rose becomes manager, computer installations, while Mr R. I. Halliday (distribution), Mr N. K. Jackson (gifts) and Mr J. Templeton (production) have all been appointed computer managers.

Mr Brian Higgins has been appointed managing director of CalComp Ltd, which was formed recently to provide comprehensive services for CalComp Digital Graphic systems in the UK.



HIGGINS

Mr Peter Merrick and Mr Philip Howard have both been appointed to the board of Lowndes-Ajax Computer Service. Three new executive appointments have also been made. These are Mr Peter Dooley as manager of Contract Systems and programming, Mr Gordon Cairns as manager of the payroll service and Mr David Bennett as systems consultant for manufacturing applications.



MR ALAN SUTTON, newly appointed sales manager computers for the Solartron Electronic Group is seen here (centre) demonstrating points on Solartron's new digital controlled H57-6D computer system at Farnborough to MR R. J. LEES, Deputy Director RAE, (left), MR E. G. C. BURT, head of Weapons Department, RAE, (front). In the background is Mr E. R. PONSFORD, managing director of Solartron. Mr Sutton's new post combines responsibility for both analogue and digital sales.

The team of consultants for SIA Ltd (Service in Informatics & Statistics) has now been announced with its completion of the appointment of Mr Martyn Jeffreys as its operational research consultant.

Mr Jeffreys took up his position at SIA in July.

He was for two years manager of CEIR's, now Scientific Control Systems, Mathematical Programming Division and before that in the operational research division of BP.

Mr Barry Jackson is SIA's commercial consultant and joined the company in March.

For four years he was administration manager with Ultra Electronics after being organisation and methods officer with Marconi.

SIA's consultant in the engineering and scientific fields is Mr Gerald Pick.

Mr David Hale, having just completed a major study for the International Publishing Corporation on book manufacturing, has taken over as locum managing director of ITEC.

BCS members retiring

AT THE next annual meeting of the British Computer Society five elected members of the council are due to retire. However, in the new articles of association adopted in March, the number of elected members on the council was increased to 18. This means there will be eight vacancies for elected members.

This time the council will not make any nominations and invites nominations from members of the BCS. Nominations must come from four or more full members and must be accompanied by the candidate's written consent. In the event of there being more than eight nominations there will be a postal ballot.

Nomination papers can be obtained from the secretary of the BCS and should be returned no later than August 28. Ballot papers, if required, will be sent to all members after September 4. The results will be given at the AGM on Wednesday, October 2.

Until a students' membership is formed the council will organise a separate ballot among students for a representative to serve on the council.

Mr John R. Mills now becomes planning executive at the National Computing Centre after joining the centre in 1967 as the head of the Public Services Department. He will be responsible for the development of project planning, and approval and control procedures.

Myriads will be base of message switching system

THE largest, fully automatic message switching system yet ordered by the British government is to be based on Marconi Myriad computers and will be used by the Ministry of Defence to supply a multi-computer system for the Defence Communications Centre buried deep under central London. The £1 million contract awarded to the Marconi Co by the Ministry of Technology is the third major order of the MARS system, Marconi Automatic Relay System.

The ministry's MARS system will initially handle connections between over 200 remote on-line terminals (teleprinters, data transmission equipment, etc). The Myriad computers on which the system is based, use integrated circuit techniques, providing fast, on-line operation and high reliability.

Claimed to be the largest outside the US and possibly the world, this massive system for switching military teleprinter messages and data traffic, will handle internal communications between the separate branches within the ministry and will also form the hub of the military services network in the UK and overseas.

Manual routing will be completely eliminated and all messages will be accepted immediately and stored on magnetic discs, to be transmitted automatically to the appropriate destination as lines become free.

The system will not only be concerned with connections between teleprinter terminals, with transmission rates in the region of 50 bauds, but will also handle high speed data transmission channels at up to speeds of 2,400 bauds and will cater for a wide variety of codes and message formats.

The preparation of messages on paper tape at the terminals is entirely eliminated, the messages being compiled on-line, directly into the system. The usual complex communications message format is reduced to a simple plain-language form, suitable for use even by inexperienced operators. This is accepted by the computer system and expanded into the full communications format required by the major networks to which the system is connected.

Special codes at the start of the message will define distribution lists of recipients. The computer will print these lists out indicating those addresses where multiple codes are required and will then transmit the message

with the appropriate number of copies to each address.

Messages can be monitored and edited on electronic tabular displays without the need to extract them from the magnetic store, thus reducing transmit delays previously experienced in manual systems.

The complete system is to be installed by Marconi engineers and is expected to be in operation by the summer of 1970. The appropriate standard MARS software packages will be provided as part of the system together with additional software for special facilities.

One of the two other major orders for MARS is currently being installed for the Cyprus Telecommunications Authority in Nicosia.

Kodak's second 360/50

A SECOND IBM 360/50 has been delivered to Kodak Ltd in Ruislip. Scheduled to become operational later this month, the new system will take over the work-load of the first machine running established programs in PL-1 (Computer Weekly, April 18).

The first 360/50 delivered in November last year as a replacement of an Emidex 1100, will be used for program development work. The similarity of the two 360 systems will allow each to act as a stand-by for the other in the event of failures.

The two computers have been installed for Kodak (UK), as a part of a policy of international standardisation on the 360 systems and PL-1.

PUZZLER

AN anti-aircraft missile which is travelling north at a constant speed starts homing onto a bomber which is dead ahead, at the same height, and 20 miles away. The bomber is flying east at a constant speed which is exactly one-third that of the missile.

Assuming that the bomber continues on the same course, what distance will it travel before being struck by the missile? The problem may be easily solved without the aid of calculus, if one finds the correct technique. See page 15 for solution.

DIARY DATES

	6	JANUARY	2	9	16	23	30
Monday	3	10	17	24	31		
Tuesday	4	11	18	25			
		12	19	26			

AUGUST 21-28

130th annual meeting of the British Association for the Advancement of Science. DUNDEE.

SEPTEMBER 2-4

Numerical taxonomy. University of St Andrews, ST ANDREWS, Fife, Scotland.

SEPTEMBER 3-OCTOBER 6

Office equipment exhibition. VIENNA.

SEPTEMBER 3-13

Thirty-third general meeting of the International Electrotechnical Commission. Imperial College, KENSINGTON, London, W8.

SEPTEMBER 4-5

Industrial fluidics seminar. John Dalton College of Technology, Chester Street, MANCHESTER.

SEPTEMBER 4-6

Third conference on Cybernetics. Joint Czechoslovak Cybernetical Society and Slovak Cybernetical Society conference. BRATISLAVA, Czechoslovakia.

SEPTEMBER 7-10

Office equipment exhibition. DUSSELDORF.

SEPTEMBER 10-11

Second discussion on automated assembly. IProdE. NOTTINGHAM University, 10am.

SEPTEMBER 11-13

BACIE (British Association for Commercial and Industrial Education) annual conference. Trinity College, CAMBRIDGE.

SEPTEMBER 25-27

Operational Research Society, conference. EDINBURGH.

OCTOBER 9-15

Interkama '68. Fourth international congress and exhibition for instrumentation and automation. DUSSELDORF.

OCTOBER 15-21

Data processing systems applied to economical processes, symposium. The Association of Scientists in Romania. BUCHAREST.

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PRODUCT NOTEBOOK

NEW RANGE OF DIGITAL MAG TAPE RECORDERS

A NEW range of incremental digital magnetic tape recorders has been launched by the Europe Engineering Co Ltd and Unit Data Ltd. They are Models 901, 902 and 702B.

The range has a wide application in scientific, industrial and commercial establishments for collecting data or magnetic tape in computer formats or re-equipment.

Models in the Unit Data range can write or read standard computer formats, including the latest nine-track tapes. Two sizes of machines are available, one taking up to 1,200 feet of mag tape, the other 2,400 feet.

Model 901 writes and reads mag tape incrementally and has been designed to replace punched paper tape equipment. The Model 902 incremented digital recorder writes on nine-track tape at 800 bpi and on 8½-inch diameter tape reels.

Model 702B writes seven-track IBM compatible tapes at 200 or 556 bpi.

The Europa Engineering Co Ltd, 12 Abingdon Road, London, W8. Tel: 01-937 5288. Manufacturers, Unit Data Ltd, Creeksmoor, Poole, Dorset.

This Facit PE 1500 high speed paper tape punch, designed for all-round duty, is now available in the standard 19-inch rack-mounted form. The unit includes fully automatic tape dispensing with "tape low" indicator and take up spooling as standard.

Facit Odhner Electronics Ltd, Eastgate Court, Rochester, Kent. Tel: 0634-43485.

Rigid discs used as storage medium

A NEW series of inexpensive random access computer memories using rigid magnetic discs as a storage medium has been introduced in the US by Infotechnics Inc.

The MDM-X memories are modular designs using a single disc encased in a protective cassette which also serves as an interchangeable loading cartridge. A feature of the machine is the ability to use both disc surfaces at once by utilising two groups of independently moving magnetic transducers, one servicing the upper surface and the other the lower one.

The transducers are controlled by digital and random access electromagnet prime movers which the firm also manufactures.

All machines in the series are provided in the form of a desktop cabinet and include disc handling mechanism, a cassette loading frame and synchronous motor together with a quick stopping electric brake.

The random access prime movers — MDM-1 to MDM-4—each handles one head. In all cases the upper head positioner swings up to permit loading. A maximum of 128 tracks on each disc surface is used.

Infotechnics Inc, 1573 Stagg Street, Van Nuys, California.

Visible filing system

THE newly-developed Anson "Vistapak" visible filing system made by George Anson and Co Ltd has been adopted by Debenhams (Central Buying) Ltd at their new administrative centre in Taunton, Somerset.

They are one of the first companies in the country to adopt the system which is built up from basic 4 feet wide sections, each being supplied with three shelves or more, according to individual needs.

Immediately in front are further mobile sections which move smoothly from side to side on runners fitted to the rear section.

Consequently, all files are fully visible and easily accessible.

Suspension of the files is effected by means of a plastic carrier bar inserted into the spine of each folder. The carrier bar itself is then suspended on guide rails at an angle, giving complete visibility to all files on each shelf and to a large number of shelves.

The Anson system at Debenhams used in conjunction with an ICT 1902, uses six different coloured title strips and plastic signals in 12 different colours, permitting 72 variations of colour coding. The use of the colour coding enables the company to identify the department being supplied with goods, the clerk responsible for the control, and the date by which payment must be made to qualify for maximum discount. When the file is removed from the carrier bar, the bar remains in the unit, indicating that the account is still "live" and the file is in the possession of the individual responsible for it.

George Anson and Co Ltd, Anson House, Southwark Street, London, SE1. Tel: 01-486 5081.

Cutting costs

AN EXAMPLE of how modern equipment, when correctly designed, can increase output and cut costs is shown by the new EMICON S1000 machine tool control introduced by EMI Electronics Ltd.

Numerical control with the S1000 means increased productivity, by cutting lead times, by reducing floor to floor time and by enabling production to be accurately scheduled and costed.

This advanced, yet simple modular system eliminates operator error and fatigue and provides a choice of facilities, including linear and rotary positioning and line milling a variety of tools.

Among the features of S1000 are: Ergonomic design treatment—simplicity of control with easily learned routine; calibrated zero shift simplifying work piece location; absolute analogue measurement for accuracy; advanced solid-state design with inherent reliability; any tape code — any machine; and first class after-sales service.

EMI Electronics Ltd, Hayes, Middlesex. Tel: Hayes 3888.

Faster than ever

COMBINING a 10-key adding machine with a high-speed printing calculator the new Monroe 570 calculating machine has the ability to perform every office calculation faster than ever thought possible.

The machine is light and compact, has a large capacity and is easy to operate. When doing a division problem a depression of only two control keys produces the answer. The 570 stops when it has calculated the required number of places so there is no meaningless zeros.

Litton Business Systems Ltd, Litton House, Goswell Road, London, EC1. Tel: Clerkenwell 3090.

Office copier

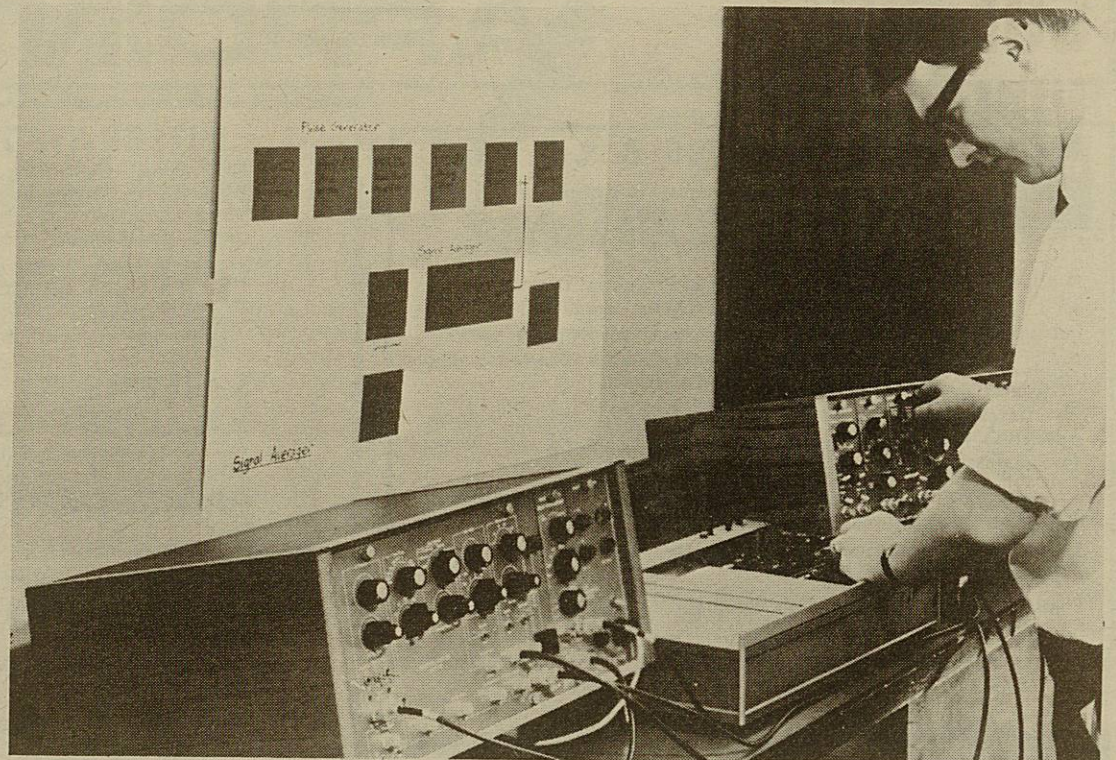
PRODUCING six quarto copies per minute for less than 3d each, the Dalcostatic electrostatic office copier has been made available by Dalcoply (UK) Ltd. The low unit cost of £245 allows for decentralisation of copying facilities.

Dalcoply (UK) Ltd, Adam House, 1 Fitzroy Square, London, W1. Tel: 387 9201.

Image brightness

UNPRECEDENTED image brightness is achieved by the new M27 high ambient light indicator introduced by the KGM Group. Characters 1½ inches high can be clearly read from up to 100 feet away. The indicator is ideal in all applications where clear reading in bright light is required.

KGM Group, Bardolph Road, Richmond, Surrey.



A non-digital fast signal averager, pictured above, developed for the recovery of complex repetitive signals from overwhelming noise has been introduced by AIM Electronics Ltd, under the title AIM System 7.3.

This instrument detects a waveform, which may be hidden in up to 1,000 times as much noise, and moves slowly along this averaging out the signal and reproducing it on a chart recorder or storage oscilloscope. Alternative outputs are available including digital or analogue voltmeters, normal oscilloscopes or, via a fast analogue to digital converter onto punched tape or printed hard copy.

AIM Electronics Ltd, 71, Fitzroy Street, Cambridge. Tel: Cambridge 62560.

Walmore Electronics Ltd. Seven thicknesses are available, ranging from .0015 inch to .0043 inch, in a variety of colours. They can be supplied in 11/16, 7/8 and 1-inch widths on continuous rolls without splices.

As a result of testing by both US and European manufacturers of tape equipment, specific Arvey grades can be recommended for use with each of these manufacturers' perforators or readers.

Walmore Electronics Ltd, 11-15 Betterton Street, Drury Lane, London, WC2. Tel: 01-836 0201.

Distinguished

A MEANS of identifying magnetic tape reels, both on a colour code, which could, for example, immediately distinguish a program tape from a data tape, and through a written description, has been produced by W. H. Brady Co Ltd. The need for separate printed labels and colour labels is eliminated by combining both on one self adhesive unit.

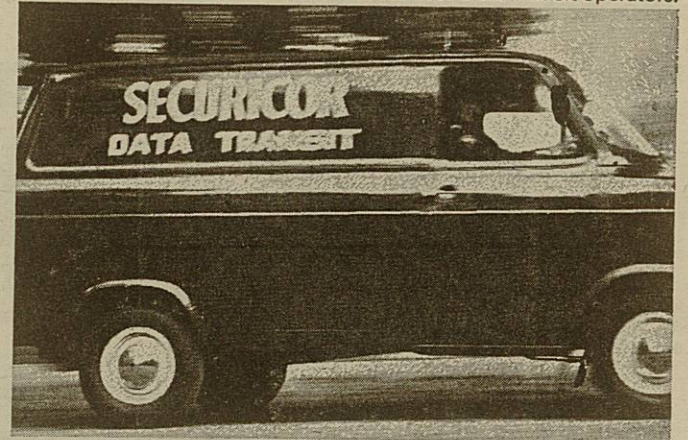
W. H. Brady Co Ltd, Breakspear Road, Ruislip, Middlesex. Tel: Ruislip 32245.

Without splices

A RANGE of mylar-reinforced paper tapes and metalised mylar tapes manufactured by Arvey Corp are being marketed by

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A radio equipped fleet of data transit vehicles working through the Company's national radio network covering all major trunk routes throughout the country. This fast, reliable, direct, punctual and economic service for the transport of paper and magnetic tapes, records, programmes and punched cards, is available 24 hrs a day, 365 days a year.

Securicor's long experience in this field enables this service to be operated with the strictest secrecy and precision. The safety of all important and irreplaceable documents is ensured from the moment they leave your premises until the moment they are delivered or returned.

Now serving the majority of main clearing banks.

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In many cases this service is cheaper than the customers own transport and safety is ensured.

Sir Ronald German, KCB, CMG., lately Director General of the GPO has joined the board of Securicor, and commends this service to you, for which he has special responsibilities

SECURICOR

Securicor Ltd., Old Swan House,
17 Chelsea Embankment, London, S.W.3.
Tel. Day: Flaxman 8191 Night: Flaxman 4831



A typical installation of the "Vistapak" systems filing units made by George Anson and Co.

APPOINTMENTS

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CHIEF PROGRAMMER

A Chief Programmer is required for the Carton Division of the Reed Paper Group. He will be expected to supervise the further implementation of an ambitious project which involves the extensive use of data collection to provide the data base for a total management system.

The computer installed is an IBM 360/20 with 16K and 4 tapes. Applications already installed include bonus, payroll and labour cost control.

A minimum of 2 years' experience is required with the knowledge of IBM assembler language an advantage.

The salary is negotiable and will be based upon age and experience.

Please write, giving full details of career to date, to the Company Secretary.

Systems Analysts

Hunting Associated Industries have vacancies for Systems Analysts to work in conjunction with the Data Processing Centre to be based at London Airport. The system is to be installed in May, 1969, and will be a 1901A Disc installation.

Applicants should ideally have had experience in working in commercial concerns and with discs. Salaries will be negotiable up to £2,500 per annum. Prospects are excellent in this expanding Group of Companies involved in a variety of industries ranging from airline maintenance to marine construction. Computer applications will be varied and will be constantly developed.



Write with brief details of experience to Data Processing Manager, Hunting Associated Industries Ltd., 590 Uxbridge Road, Hayes, Middlesex.

INTEGRATED MANAGEMENT INFORMATION & CONTROL SYSTEM

This really is the fullest, most genuine M.I.S. yet, using three large third generation computers at one installation in North London. Plans are to implement the system in several other installations within the company and eventually all over the world. Because of the size of the project and its rate of expansion the vacancies below have occurred and prospects for career development are very much above average, include management opportunities in the various installations.

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Will be deputy to the Programming Manager responsible for 40 programmers. Three or more years' programming experience is required preferably including COBOL and character M/C. Ref. 1540/CW.

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PROGRAMMERS to £1,500 20 vacancies

Nine-eighteen months programming experience of any computer but COBOL is essential. Ref. 1544/CW.

SYSTEM TEST ANALYSTS—10 vacancies to £1,400

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Nine months' or more operating experience of any computer is required. Ref. 1547/CW.

A number of clerical staff are also required — age immaterial. £600-£800. Ref. 1548/CW.

Apply to London

Write or telephone for an application form quoting the reference shown. All applications will be treated in confidence.

If you are a qualified accountant or have computer experience and wish to be kept informed on other positions which arise quote reference R.R.

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Conditions:

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To apply: Send in confidence with curriculum vitae details, salary and job wanted to N.C.R. European E.D.P. Center, 52 rue des Colonies, Bruxelles 1.

BP

has vacancies for computer staff at Head Office in the City of London to work on the ICT 1907 installation

OPERATORS

(Male)

will be involved in inputting data, console operation, maintenance and some clerical duties. Candidates, aged 20-30 should have "O" level in Mathematics (good grade), English, and one other science subject. Present staff are working on a 3-shift/5-day week basis with some weekend working, but may move to a 3-shift 7-day week. A generous shift allowance is paid.

AUXILIARY EQUIPMENT OPERATORS

(female)

will prepare data in card and tape form and operate various machines. Candidates, aged 18-35, should have the same "O" level qualifications as above, and preferably have some experience of keyboard work. Staggered hours will also be involved. Write for Application Form, giving brief details of age and experience to Mr. M. J. Telfer, External Recruitment, The British Petroleum Company Limited, Britannic House, Moor Lane, London, E.C.2, quoting reference R.10061/8 CW.



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The replacement of the Company's present 1440 Computer by a three disk IBM 360/30 system in April, 1969, creates the need for additional Programmers.

Applicants should be educated to A-level and have at least two years' programming experience, preferably with disk on a 360 system.

The Company is one of this country's leading pharmaceutical manufacturers. A competitive salary range would be offered for these appointments, together with attractive conditions of employment, including non-contributory Pension Scheme and Life Assurance.

Please send detailed career résumé to:

Personnel Officer
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Due to promotion a young man is required to join our computer operations team.

Applicants should have had 6-12 months operating experience with magnetic tapes and a knowledge of processing with paper tape input and output would be an advantage.

A second computer is being delivered next month and further expansion is planned for 1970.

Starting salary will be commensurate with age and experience progressing to £1,100 per annum. Shift working is

envisaged in the future for which a shift allowance would be paid.

Our modern Computer Centre, situated in pleasant surroundings, offers first class working conditions. Prospects are excellent in this expanding department. Please apply in writing to

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Birmingham, 31

or telephone Mr. A. Cook
Computer Operations Manager
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A SENIOR PROGRAMMER
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LOCATION — S.W. London.

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AGE RANGE — 20 to 30 (Male or Female).

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SMITH METERS LIMITED, 170
ROWAN ROAD, STREATHAM,
S.W.16.**

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From our recently completed course in COBOL we have several very promising graduates, all suitable for immediate placing as trainee programmers. We are anxious to secure worthwhile positions for them in the computer industry and invite enquiries from interested companies without any obligation whatsoever. There will be no charge to either employer or pupil for successful introductions.

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Programmers for Real-Time Systems

are required to assist in the development of software for a number of advanced simulator projects for the Royal Navy, The Royal Air Force, The Royal Australian Air Force and several commercial organisations.

These are additional posts arising from the Company's increasing activity in this field. They are sited at our new establishment at Cheadle Hulme, about 12 miles south of Manchester.

Applicants, who should preferably have a degree or professional qualification and two years experience should write, giving brief details of their career to date to:

The Personnel Manager (Ref HD76)

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BICC

SYSTEMS ANALYSTS AND PROGRAMMERS

We are establishing four major Computer Centres serving the BICC Group and covering a wide range of commercial and production procedures. To provide capability for the development of new applica-

tions and the conversion of existing computer routines, we need Systems Analysts and Programmers of proven ability preferably in the use of ICL 1900 PLAN 3 and COBOL programming techniques.

If you are interested, write to —

Personnel Officer (Central Depts.)
Central Personnel Relations Dept.
British Insulated Callender's Cables Ltd.
PRESCOT, Lancs.

or telephone PRESCOT 6571, Extension 2592

FREELANCE PROGRAMMERS

Commercial Programming undertaken at very competitive rates; for ICL 1900 in Cobol and Plan and ICL/Univac 1004. Write Box 5742, Computer Weekly.

SCOTTISH GAS BOARD

SYSTEMS ANALYST PROGRAMMER

The Board, who have been operating an I.C.T. 1500 computer for over three years are installing shortly a 64K I.C.T. 1905F with direct access devices, on-line enquiry facilities, and optical character recognition. A very wide range of commercial data processing applications is now being developed, and additional systems design staff are required. Applications are now being invited for the post of Systems Analyst Programmer.

The successful applicant should hold a university degree or appropriate professional qualifications and have a minimum of one year's computer systems design experience and some programming experience. Ability to work with minimum supervision and to lead a small team on investigation and design work is essential.

The salary for this appointment is within a scale from £1,540 to £2,025 per annum with initial placing according to experience and qualifications. The appointment is subject to a satisfactory medical examination and the conditions of employment include a contributory Sick Pay Scheme and generous Holiday and Sick Pay Arrangements.

Applications giving brief details of experience and qualifications should be addressed to:—
The Personnel Officer, Scottish Gas Board, 340 West Granton Road, Edinburgh, 5,
within ten days of the appearance of this advertisement.



MANAGEMENT INFORMATION SYSTEMS

Applications are invited from men, under 35 years of age, for a post in Procedures Branch, Computer Department, at the BP Head Office in the City of London.

The post calls for the investigation and design of management information systems. Candidates must have experience in the development of information systems and have the ability to sell numerical presentations to management. As the systems are likely to be associated with the use of computers, prior experience in this field is desirable. Salary range £2,105 p.a. to £3,165 p.a.

Please write, quoting age and brief details of experience, qualifications and current salary, to Mr. M. J. Teller, External Recruitment, The British Petroleum Company Limited, Britannic House, Moor Lane, London, E.C.2, quoting ref. CMP59/8CW.

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University of Birmingham Computer Services

An English Electric KDF9 is installed and is currently operated on a three-shift basis.

Applications are invited for Operators in the following grades:

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Age: Over 23 years.
Experience: 4 years' operating.
Education: Four "O" levels (including mathematics) and preferably with a pass in C. & G. 319 or an "A" level.
Salary: £987-£1,225 plus £200 Shift Allowance.

Computer Operators (Male)

Age: Over 20 years.
Experience: 2 years operating.
Education: Four "O" level passes (including mathematics).
Salary: £722-£1,007 plus £156 Shift Allowance.

Trainee Computer Operators (Male)

Age: 18 years and over.
Education: To "O" level standard.
Salary: £414-£575 plus £156 Shift Allowance.

Applications should be sent to The Personnel Adviser, P.O. Box 363, University of Birmingham, Edgbaston, Birmingham 15.

CARMARTHENSHIRE COUNTY COUNCIL COUNTY TREASURER'S DEPARTMENT

Applications are invited for the following posts:

(a) **COMPUTER MANAGER**
within Grade P.O. 1 Range £2,105-£2,625.

(b) **SYSTEMS ANALYST/
CHIEF PROGRAMMER**
within A.P. IV/V £1,435-£1,865.

Post (a) requires an applicant to have a record of success in controlling and developing all aspects of a computer installation. An accountancy qualification is not essential but a Chartered Municipal Treasurer will have preference.

Post (b) is available to an applicant with experience as a Systems Analyst and who is competent in PLAN and COBOL.

Installation is an I.C.T. 1902. 16K store, 4 magnetic tapes, paper-tape input.

Applications, naming two referees, should reach me before 31st August, 1968.

W. S. THOMAS
Clerk of the County Council

County Hall
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All we expect is a minimum of 18 months experience in systems programming, and an enthusiastic interest in the future.

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Or write to Mr. G. Barton,
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STEPMA—a simulator for tele-processing and multi-access

FOR THE past eight years, since 1960, a large programme of work on the digital simulation of road traffic has been carried out by the Electrical and Electronic Engineering Department of University of Manchester Institute of Science and Technology.

This work involves simulating the random arrivals in each stream of traffic, modelling the road systems with traffic signals, and connecting logic between flow lines which corresponds to the interaction of vehicles, signals, etc.

This traffic work is really a queuing system simulator, and has been done partly using programs on Atlas, and partly by special purpose digital machine. The problem is really a particular case of operational research, which applies in many areas of life such as business management, cafeterias, lifts, etc.

At the present state of the art bulk traffic flow is a relatively simple case, since one bit is quite adequate to represent the presence or absence of a vehicle. Consequently the design of a special purpose machine has at least three advantages over a simulation by program.

CHAIN CODES

First, the many independent random processes can be provided by chain codes (feedback shift register sequences). These are fast and use little hardware. Secondly the use of one bit per vehicle is an encumbrance in a normal program, needing packing and unpacking routines, whereas the special purpose machine has maximum simplicity. Thirdly the special machine can have bit-handling processes and transfers which are very cumbersome to organ-

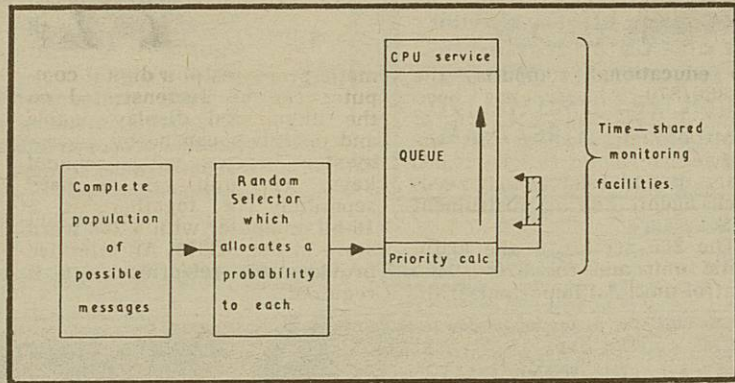


Figure 1: Tele-processing simulator

ise in a normal data-processing computer.

A special purpose machine can only be justified, of course, if the problem area concerned is able to supply a full workload. This is certainly true in the traffic case.

Computer system design is now becoming an operational research problem. In a multi-access computer system each remote user is effectively in a queue waiting for the central processor to service his program, and tele-processing or message switching computers similarly organise their messages into queues. The internal control programs or executives of large computers also need queuing theory for proper design. It now makes economic sense, therefore, to design a hardware simulator for such applications.

For message switching and

multi-access system simulation, the simple method of one bit per message is quite impossible. A software simulation method described by Weber and Gimpelson¹ used 48 bits to describe each message, and even this might not be enough. Once this change is made, however, the random generators and bit-handling methods of the traffic simulator can be directly applied to the new work.

The price of core storage today is so much less than in 1960 that it is quite economic to consider giving each message as many descriptor bits as are necessary, 48 being chosen. Similarly the design of a large logic assembly with monolithic microcircuits is now so simple and cheap that much more enterprising approach can be made than in 1960.

VITAL PROPERTIES

Consider first the processing of messages received over communication channels. The simplest processing would be to store each signal, perhaps make an elementary priority calculation, and route the message to the stated destination. This obviously leads to a queue forming in the storage portion, and system designers are immediately interested in the mean and maximum delays (or the delay distribution) which are generated by the system working on a specified input mix of programs. Obviously the mean rate and various parameter distributions of the inputs are the vital properties; equally obviously they are unlikely to fit the standard mathematical forms in many cases.

Figure 1 shows a block diagram of the simulator. The left hand block represents the complete population of possible messages or a statistically valid sub-set. A random process which is supplied with the

accurate probabilities interacts with the hypothetical population, and turns some of them into actual messages, stacking them in the queue according to priority calculation. From this point the messages are processed according to the characteristics of the real processors, the whole of the queue being monitored continuously for the various parameters.

The multi-access computer system is very similar in concept but usually has a much more complicated set of internal control algorithms. Figure 2 shows the simulator block diagram for this case. In this case the first random selection may not need to be simulated, and a statistical spread of logged-in users may be sufficient. When any user completes a line of script on the typewriter or CRT input device, then the accept signal puts the associated user program and the new material into the queue. In this case there is a complicated algorithm which periodically re-sorts the queue, depending on such features as drum phrase relative to heads, message lengths in core, etc.

Similarly after service the program can be put back into the system in several ways. Once again time shared monitoring facilities are necessary. When using such a simulator on problems encountered when designing Executive programs, then many possibilities exist at the simple design levels. At least two uses which relate to the overall Executive problem can be outlined however.

First, one problem with control programs is the determination of how much free computer time is left for user programs after the controlling routines have been satisfied. By filling the population store of the simulator with all the executive routines, i.e. their total time of operation, probability of use per second etc, then the simulator can run the particular mix and compile the machine user-program statistics.

Secondly, the normal method of use of fast peripherals, which cannot stop on a character, is to design the CPU interrupt and hesitation system on a "worst-case" basis such that if all the fast peripherals signal together, they can all be serviced within their crisis time. The type of simulator proposed here could investigate whether particular configurations might be more efficient overall if a statistical approach was taken, where perhaps in one per cent of the unfavourable cases one peripheral had to re-read the

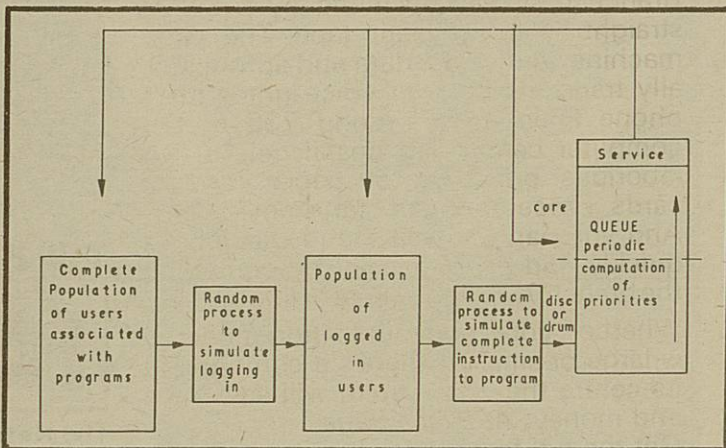


Figure 2: Multi-access simulation

Formerly a special lecturer (part-time) in electrical engineering, Frederick George Heath is now Professor of Digital Processing (part-time) at the University of Manchester Institute of Science and Technology.

In 1958 he was appointed to a lectureship in the Department of Electrical Engineering at UMIST. He re-joined Ferranti in 1962 as chief engineer in charge of development in their Computer Department, but retained his connection with the institute through his appointment as special lecturer in electrical engineering.

Following the amalgamation of Ferranti's computer interests with ICT he was appointed chief engineer and deputy to the manager of the Engineering Division Design Department in ICT.

His research work has been mainly concerned with the digital computers and he is the holder of three British patents. At UMIST he applies digital processes in a wide field of various branches of engineering, particularly communications.

By Prof F. G. Heath

block in question. Certainly as Executive programs have to cope with more and more on-line equipment, the queuing behaviour inside the control program will approach the multi-access case.

The 48 bits describing each message have been allocated as follows: 2 bits — status (i.e. which queue); 7 bits — position in queue; 4 bits — length of message; 6 bits user-allocated priority; 6 bits — computed priority; 4 bits — drum or disc phase; 7 bits — poisson arrival control; 6 bits — delay counter; 6 bits — flag bits and spare.

The core store used is 16 bits wide, so three store words make up one message. Figure 3

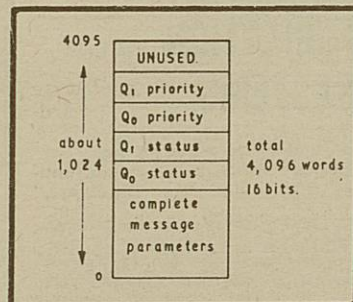


Figure 3: Core store division

shows the core store division. The essential quantities in each message are taken to other parts of the core store, which are used for re-ordering the messages according to computed priority.

If the simulator is to be described in computer terms, then the data-flow is made up of a small number of quite complicated macro-functions.

CLOCK PULSES

These may be briefly listed:

1. Random Generator Interaction. — Each message is extracted in sequence, and its poisson generator bits are used to set up the particular arrival probabilities in a chain code generator. This is operated by a number of clock pulses which represent the accumulated time in the real system since the previous use of this instruction. If the generator gives an output this sets a flag bit in the computer word, and is used to change the message status etc.

2. Status change. — The front of the queue will usually be limited in size, say by core capacity. This macro uses an address to sum the high priority messages and keeps the first

queue within the available storage capacity.

3. Status sorting. — This extracts each message in turn, examines its status and puts it in the correct store area for subsequent sorting within the queue.

4. Queue sorting. — This macro takes the messages of any status, and sorts them into priority order. This is done by a very simple arithmetic process which sequentially examines two registers.

5. Service. — This macro gives the program at the head of the queue a service time which is exponential arrival in form, but truncated at some maximum (as in figure 4). The message may then go to the back of the queue or to some intermediate point.

6. Priority Calculation. — The calculation of priority in such a simulator is of great interest, since any special methods will be directly useful in the message switching or multi-access computer itself. Clearly the accuracy of calculation is not needed better than one or two per cent, since two messages of nearly identical priority should normally be interchangeable in time order without ill effects.

OUT OF PLACE

Examining typical priority algorithms for such work, multiplication and division are often used, yet a fast hardware multiplier would be out of place in a simple machine. Consequently one of two methods can be used. The first, which was described in W. J. Poppelbaum's paper², is to use mixed analogue and digital methods.

If the various message parameters are encoded logarithmically, then simple digital to analogue converters, followed by analogue addition and conversion back to digital, should be quick, simple and accurate enough. Alternatively approximate digital methods may be used, such as are described by K. Dean in two papers about to be published by the IEE.

In any case, there must be enough orders in the machine code to cope with the range of algorithms which are used in practical systems, and this part of the design will not be started until the remainder of the machine is working, so that practical operating experience will be available.

7. Monitor — There must be an instruction which interrupts the simulation and punches out

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FOCUS ON PROGRAMMING SCHOOLS

ARTICLES appearing in the July and August issues of Focus, the journal of the Consumer Council, take a critical look at the benefits of a programming course. The schools mentioned are the Fich Institute of Data Processing, the School of Computer Programming Ltd, the London School of Computer Training and Stafford House Computer Courses.

Valuable advice to anyone taking a course at these or other schools is included, and while the general trend of the articles is critical some positive points are noted.

A thorough reading of the two articles should be recommended to everyone considering attending such schools, and an understanding of them would do much to avoid the problems that have beset many of those who have attempted to enter computing via this channel.

The issues are available from the Consumer Council, 3 Cornwall Terrace, London, NW1, at 2s 6d each plus postage.

★ COLLEGE computer teachers met in Leicester recently for the Department of Education and Science's fifth annual course which was devoted to a review of developments in the City and Guilds courses for computer personnel.

COURSES

APACE CENTRE TO HAVE CAD IN NEW SESSION

THE pattern in mechanical engineering applications has become well established at the centre for the Aldermaston Project for the Application of Computers to Engineering, APACE, and the forthcoming autumn programme includes new courses in computer aided design in the electronic field.

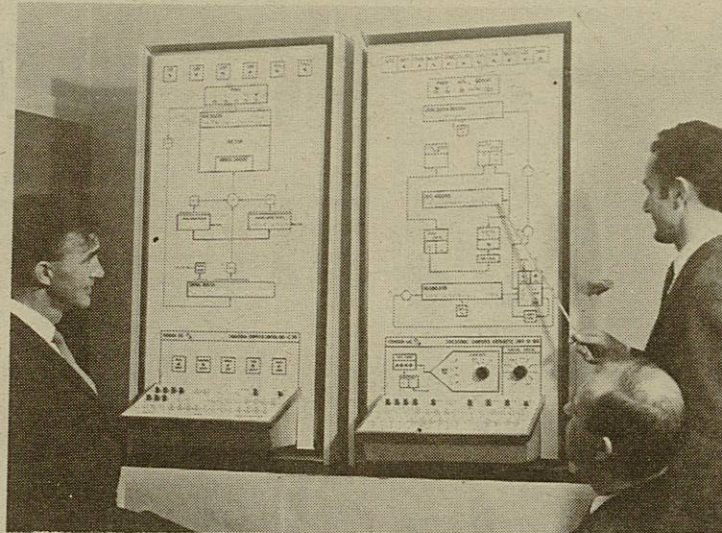
This introductory course lasts for 4½ days and runs from September 23 to 27 and from November 11 to 15. A fee of £54 is payable.

Other courses being held at the centre are: Computer appreciation for engineers (14 days, fee £48)—October 1-4, October 29-November 1, November 19-22, and December 17 to 20; 2CL users course (4½ days, £54)—September 16-20; APT Part I (4½ days, £54)—October 14-18; FORTRAN programming for engineers (5 days, £60)—November 4-8; and circuit analysis users course (3 days, £36)—December 10-12.

Further information about these courses or other APACE services can be obtained from the Secretary (Ref: CW), APACE, UKAEA, Blacknest, Brimpton, near Reading, Berks. Tel: Tadley 4111, ext 5951/5873.

Traffic committee set up

A TRAFFIC Instrumentation Committee (TIC) has been set up to liaise between the Ministry of Transport and industry in all aspects of traffic engineering, instrumentation and control. Industrial membership will consist of a joint group representing the interests of SIMA (Scientific Instrument Manufacturers' Association), EEA (Electronic Engineering Association) and BEAMA (British Electrical and Allied Manufacturers' Association). Some 34 member companies are represented by this joint group. Mr J. T. Duff, assistant chief engineer of the ministry, will be the chairman.



An educational computer, the EC360/370 Abacus, has been ordered from Feedback Ltd, of Crowborough, Sussex, by the Norwegian Air Force. The £4,000 order was placed through Feedback agent, Feiring Instrument A/S.

The 360 section is the arithmetic unit and the 370 is the control unit. All important arith-

metic processes of a digital computer can be demonstrated on the illuminated display panels and operation can be by a step-by-step process using manual keys. The unit can be used separately or together as a 16-bit computer with a 256 word store in the EC370. An interface provides for teleprinter I/O if required.

Data transmission test success

IN the course of stepping up their experiments in data transmission ICL established a link between two 7013 Data Transceivers located at Stevenage and Sydney. The link was in operation for 45 minutes, in which time over 160,000 characters were transmitted without error.

Using the public telephone network with a standard modem in the UK and an SEL GH 2011 modem in Australia the 7013s, each with a paper tape reader and punch, transmitted at a speed of 1,200 bits per second and turn-around transmission produced a rate of 60 chps.

Less than one per cent of the transmitted 80 character blocks showed line-induced errors necessitating corrections.

Developing techniques

DEVELOPMENTS in management practice and technology will be among the subjects discussed during a Management Techniques Week to be held in London from September 30 to October 4. Details available from the BIM, Management House, Parker Street, London, WC2.

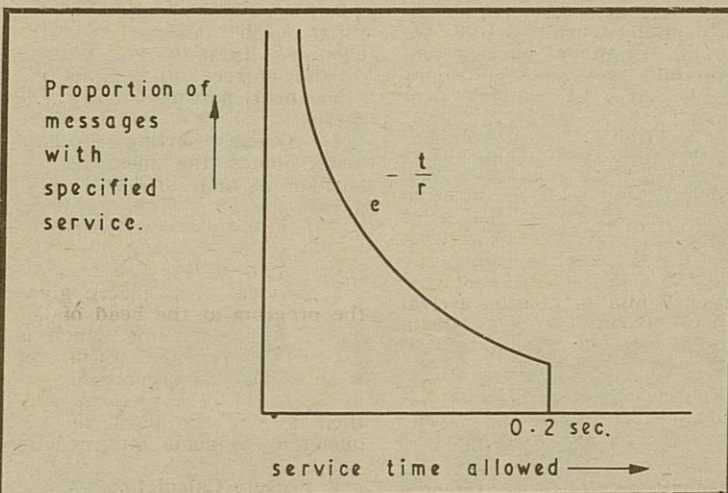


Figure 4: Truncated exponential arrival service distribution.

From page 6

on paper tape, or some other device, the raw data of the system. This can subsequently be computer processed. There must also be a type of single shot operation and direct display, so that manual assessment of situations can be made.

The microprogram of the machine is very simple, being like the early plug-board programmed computers. A 4 x 4 matrix of sockets is scanned sequentially, by the action pulse, and a lead may be connected from each one to one of the macros. This should be sufficient for the early work, later it may be necessary to have the flexibility of a stored program system. Each of the macros generates time according to the real machine functions involved, and these times are accumulated in a register and used to drive the poisson generators when required.

The initial design, i.e. without intricate priority calculations, uses a 4,096 word 16-bit store and about 700 TTL microcircuits. We expect it to beat real time by quite a factor, and the cost per unit of performance should be at least 40 times less than a normal software simulation.

Since many of the elements and processes required in STEPMA correspond to those needed in an efficient message-switching computer, the project should form a useful training ground for engineers who will be needed in this type of application. Some of the engineering principles used in the simulator may also be useful in these new fields of design, which will include so-called

"firm ware" (software processes performed by hardware).

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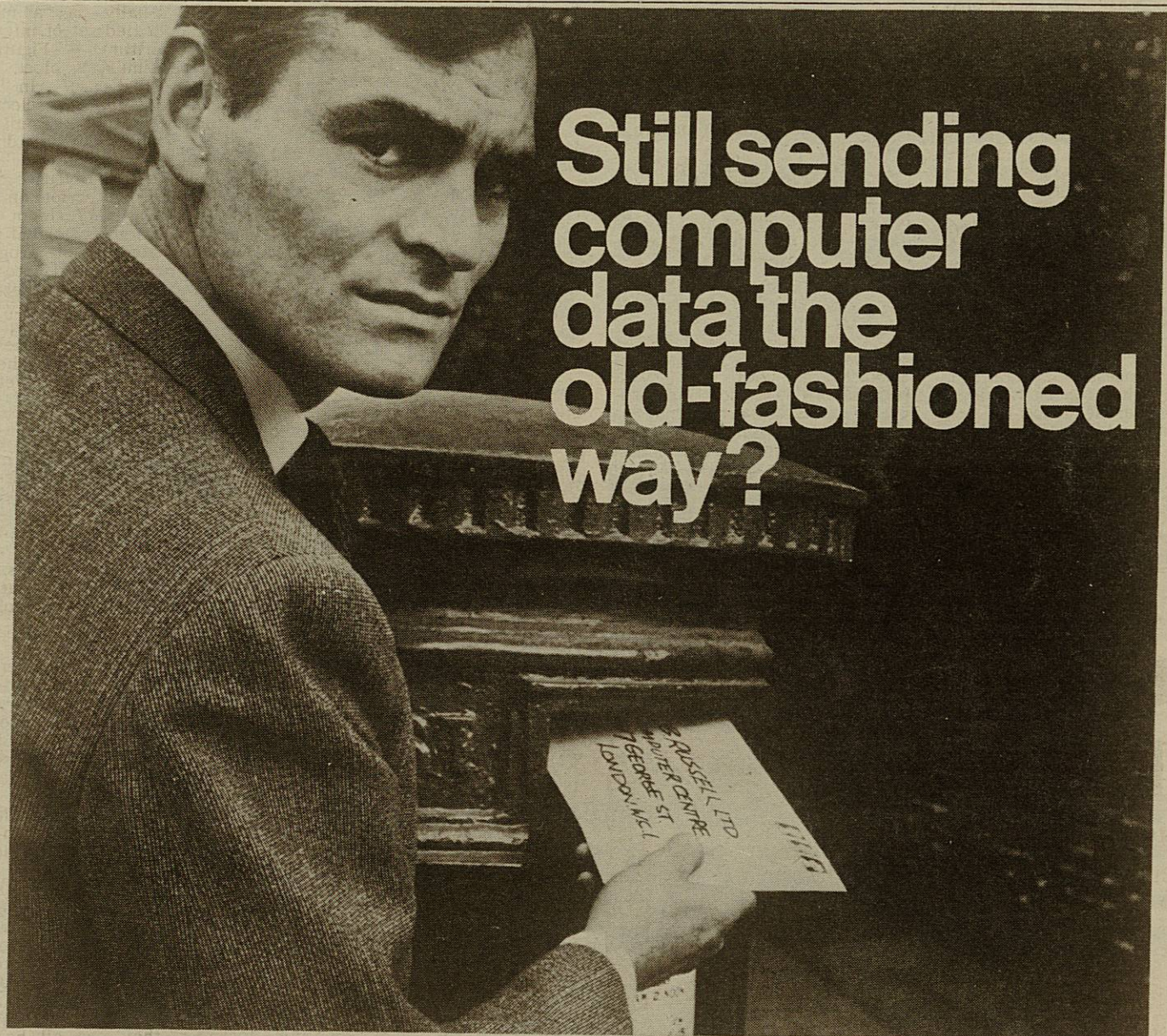
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- 5 Poppelbaum, W. J.: "Hybrid Graphical Processing," Computer Technology, IEE Conference Publication 32, pp. 53/1-25 (1967).

Sheffield bureau orders B3500

THE first computer service bureau in Sheffield, Electronic Data Processing Ltd, has ordered a £200,000 Burroughs B3500 to replace a B383 which went into operation under two years ago (Computer Weekly, 27 October, 1966).

The bureau now has over 70 regular clients and needs a multi-programming facility to cope with growing demands.

The 3500 will have 50K eight-bit bytes store, four magnetic tapes, a random access disc file, paper tape and card input equipment and a 1,000 lpm printer. Delivery is scheduled for June 1969.



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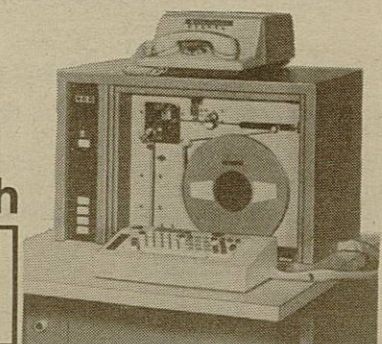
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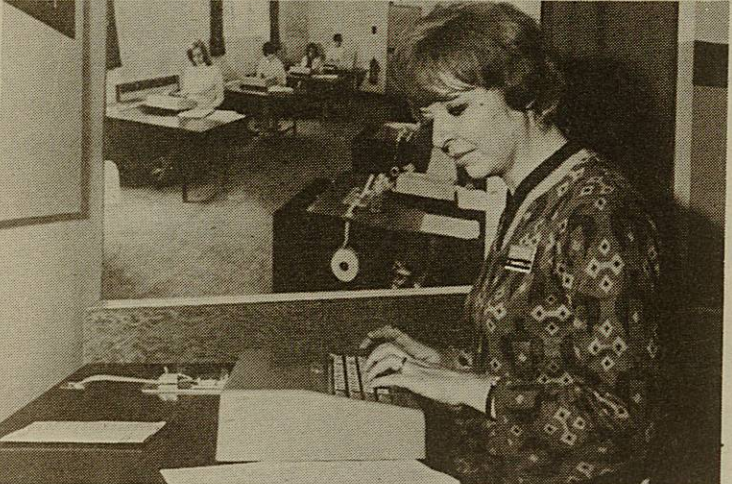
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Terminals and data preparation equipment were well represented at the Waverley Hall. Three pieces of equipment which attracted considerable attention were (top) the Olivetti TCV250 on-line video terminal; (centre) Honeywell's Keypate magnetic tape encoder which was on public show for the first time; and (above) Kode's K72 punch verifier.

IFIP CONGRESS 68 ROUND-UP

SO CONGRESS 68 is over, and delegates to the fourth conference of the International Federation for Information Processing have left Edinburgh to its tourists and Festival crowds. Now there is time to take stock of what took place during that crowded week, and to see what has been achieved.

One thing is certain. There may have been too many papers with delegates only able to see and hear a fraction of what they wanted to, but the new contacts and the new friendships that have been made will benefit the cause of computing throughout the world.

The sunny weather took the sting out of the long walks between lecture halls, but it did not ease the disappointment that many of the 3,863 delegates felt on arriving to find that all the seats at the chosen session had long since been taken.

In a way these inadequacies were the best measure of the success of IFIP. If people had not turned up in the numbers they did, neither the exhibition, the lectures, nor the hotels and restaurants, would have been as crowded as they were.

The organisers had always claimed they expected this number of people so they cannot be excused for some of the inadequacies. As in the case of so many congresses the need for more professional advice in the organising was clear.

In the usual Edinburgh tradition there were ample "beyond the fringe" activities, and participants had the choice of official and unofficial programmes.

Same quality

The quality of papers was much the same, but while the official list had concentrated on more theoretical aspects, the private sessions dealt more directly with commercial tasks and applications.

The key to the IFIP congress was without doubt the sessions of invited rather than submitted papers. There were 35 of these, the authors included representatives of all major computing countries. The topics, as shown the titles, range from the ob-

secure. A Survey of Some Results in the Field of Discrete Mathematics, by S.V. Yublonki, to the popular, "How to Succeed in Software," by Prof S. Michaelson. This last was a succinct paper and is dealt with more fully later.

The commercial or manufacturers' sessions took place in the traditional hotel rooms and sponsors ranged from the National Computing Centre, the GPO, and major makers, such as ICL, who all ran several sessions, in single presentations by companies such as Mohawk Data Sciences and Kodak.

The IFIP conferences have always been notable for two things, the quality of the papers presented and, even more important, the quality of the people attending. Edinburgh was no exception, and it is no exaggeration to say that if some form of disaster had struck the delegates en masse the progress of computing might well have been put back a decade.

Computer men still have difficulty formally communicating with their machines and need increasingly complex languages and compilers to do so. At personal level language was no problem, and many of the current aspects of computing were settled in heated discussions in hotel lounges. Many of the problems of the next generation were perhaps also started in similar discussions.

The 214 submitted papers covered between them every aspect of computing, from hardware, through software and

applications of computer techniques in all disciplines.

Some of the hardware papers were purely theoretical, and gave people the chance to present ideas which as of now are entirely theoretical, with no prospect yet of building a machine to match.

One such was a paper given by P. C. Macnaughton, of Toronto University, who spoke on a hardware design called a virtual multi-processor in which the system would switch modules in or out of use according to need.

Various sizes

On the software side papers were given on compiler techniques, commercial programming, application languages, software design and implementation of operating systems on various types and sizes of computer.

Some of the applications papers and fringe topics were among the most interesting, including an amusing paper by Mr Basil de Ferranti which drew some comparisons between organisations, computers and human brains from the computer man's point of view.

Applications papers covered such topics as information retrieval, design automation, artificial intelligence, pattern recognition, as well as more commercially oriented topics such as management data bank organisation.

The most high brow of all the submitted papers were undoubtedly the mathematical ones, which included treatises on differential equations, linear algebra, numerical analysis, mathematical programming and the theory of computation. These will undoubtedly have been most interesting to delegates who were able to study the written paper beforehand.

As it is impossible because of sheer volume to comment on all papers, space can only be given to a few of the most significant.

One of these was undoubtedly that of Professor Sidney Michaelson, not only because he is one of the leading lights of computing at Edinburgh University, but also because his invited paper contained some of the most pungent comments expressed during the whole week.

Prof Michaelson's contention is that most of the good software in use today has

Big success for UK's first real computer show

Although, like many conferences, the 1968 IFIP Congress suffered through having too little time to cover all topics fully without a considerable overlap, the accompanying exhibition was, in the opinion of many exhibitors and visitors, an unqualified success.

For almost the first time in the UK the majority of the computer manufacturers and several major users were able to display and demonstrate the fruits of their endeavours without being submerged in a large exhibition catering for the diverse interests of other organisations.

The resultant compact exhibition was, moreover, totally relevant to current developments in the industry. Many of the larger manufacturers, being committed for the next decade to central systems which they have introduced over the past five years, did not use the show as a "shop window" for their hardware, but preferred to demonstrate the capabilities of these machines using on-line terminals.

The peripheral manufacturers on the other hand, within whose market the major innovations are now taking place, were given a clear field in which to show their newest products.

REMOTE SITE

While emphasis was given to this overall theme by Control Data Corporation, who flew in a 160A computer from the USA especially for the exhibition and then installed it at a remote site to demonstrate the capabilities of their new CDC 200 User Terminal (a combined CRT display with typewriter input, card reader and line printer), slight departures from it were made by ICL and Burroughs.

Both of these companies were displaying medium sized com-

puters from their latest ranges, though in both cases the machines were used to complement the theme of the stand. ICL had a 1903A installed in addition to the numerous terminals and research projects on display while Burroughs had a B3500.

The 1903A was being used in conjunction with a CalComp drum type plotter, showing the ability of this peripheral to function as a design instrument—designing components of the larger 1906A and 1908A computers.

In transit to Fine Fare Ltd, the grocery chain group, the B3500, temporarily installed on the Burroughs stand was used for live running of the customer's programs, in addition to handling other work.

In this it highlighted the Burroughs' theme which was oriented towards the use of the MCP operating system — and thus served as an introduction to their larger multi-processing systems, the B6500 and B7500.

By mid-week the already comprehensive display of communications (rather than data processing) oriented computers at the exhibition, which included items from Digital Equipment's PDP ranges, Modular 1 from Computer Technology and several machines new to the UK from Hewlett Packard, was enlarged by the arrival of the Elbit 100. The computer, the first product of the Israeli Elbit company, was shown with teletype input/output.

Other foreign companies introducing their products to the UK included the French Compagnie Internationale pour L'In-

formatique (CII) — formed under the national Plan Calcul — who were content to have a replica of their proposed large system on their stand, together with details of the 10010.

Again reflecting the current trend in computing the peripherals side of the exhibition was dominated by communications terminals — and in particular by CRT displays, either shown independently by the makers or on the computer manufacturers' stands and users' stands linked to remotely located systems.

NEW ENCODERS

The domination of this type of equipment was not, however, absolute. Many manufacturers of conventional punched media data preparation equipment, magnetic tape encoders, and hard copy output and input units, were also present at the show. Mohawk Data Sciences, world leaders in the field of direct magnetic tape encoders, showed their established ranges, together with new ticket encoders, and Honeywell used the exhibition for the first public demonstration of their Keypate encoders.

A new, and unconventionally designed, paper tape punch for on-line or off-line data recording was introduced by Facit. Offering several unique features this unit has been produced for easy interfacing to many different systems and to withstand severe environmental conditions.

Among the new data preparation units to be seen were a punched card system from ICL

DATAFAIR 69

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No advance registrations for delegates can be accepted.

BENEFITS OF AN EXTENDED WEEK

ated in universities on
side of the Atlantic, and
erefore asks why the uni-
es should have to pay the
ctors to support their
re divisions, and then
their own systems.
had some practical sug-
ns about how to write
sful software, of which
rst was: Don't trust com-
manufacturers.

Protected

also believes that small
ct groups well protected
the political machinations
agement are the ones
to the most effective work.
s how groups composed of
sity and manufacturers'
were organised to write
perating system for the
system 4/75 which Edin-

burgh University is to have at
the Regional Computing Centre.

Prof Michaelson's strictures
on manufacturers' time sharing
software are best expressed in
his own words: "It is clear that
the manufacturers are stuffed
with good, competent, thought-
ful people — in fact some of
them are my ex-students. Yet
they put out software which
looks like the effects of pre-
frontal leucotomy . . ."

In view of the parlous state
of large scale data communica-
tion facilities in the UK at the
moment the invited paper given
by Mr D. W. Davies, of the
National Physical Laboratory, on
Communications Networks to
Serve Rapid Response Comput-
ers, was of topical interest.

Mr Davies believes that the
assumption that a standard in-
terface and a communications

network should be "add-on"
units to a computer should not
be accepted if the best solutions
to the problems of data com-
munications are to be achieved.

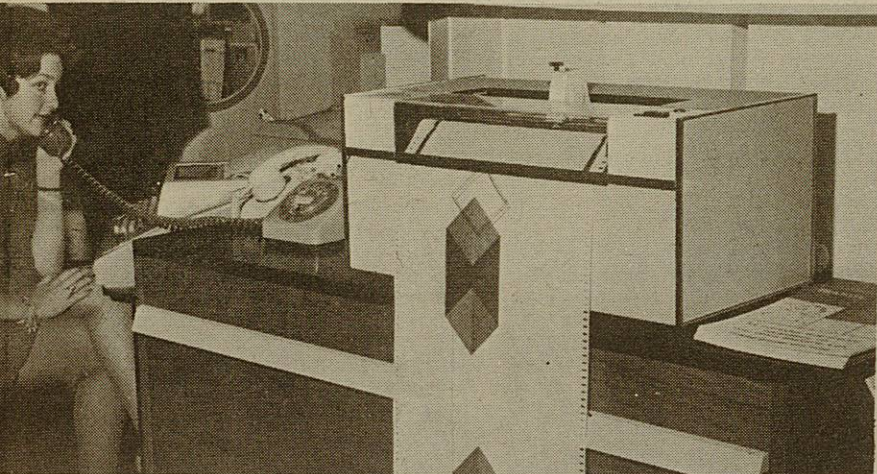
The feasibility of a store and
forward network was discussed,
and Mr Davies concluded his
paper by reiterating that the re-
quirements of real time systems
may demand a purpose built
network of a potential that
adaption of the existing tele-
phone system would never reach.

Extra mural sessions included
a discussion on program protec-
tion in the 1970s, which at the
end of two hours talking could
be summarised as inconclusive.
There was not even agreement
as to whether copyright on
patent protection was a good
thing, though most but not all
delegates taking part seemed to
assume that it was.



After officially declaring Congress
68 open at the Usher Hall, Lord
Mountbatten toured the exhibition
and visited many of the stands.
Here he is seen trying his hand
with a light pen under the guidance
of an ICL man. On the extreme
right of the picture is Mr Arthur
Humphreys, managing director of
ICL, and next to him is Mr William
Ross, MP, Secretary of State for
Scotland. In the background is
Baillie Maurice Heggie representing
the Lord Provost of Edinburgh.

On show for the first time in this
country was CalComp's 718 flat
bed plotter which has a 4½ ft by
6 ft plotting area. It was seen
operating with special contouring
software packages.



One of the items on the
busy NEL stand was the
exhibit showing Computer
Instrumentation Ltd's re-
mote terminal plotter in
action. This unit is the
first one to be delivered by
CIL and was moved to the
laboratory at East Kilbride
after the show. This
plotter has a standard 14-
inch drum, teletype unit,
special interface and GPO
modem and telephone. CIL
are also producing a model
with a 22-inch drum.

Mark IV version of the
on punch verifier. This
n enhanced version of the
on punch/verifier, is ex-
eventually to incorporate
d copy print-out made
n a miniature line printer
core buffer store.

copy input equipment
shown included Farring-
ER readers, while output
included a number of Cal-
plotters. California Com-
Products, the manufac-
had their own display in
n to their equipment
n other stands. Their dis-
cluded a number of drum
plotters and a large flat
nit, the 718, which was
lic display for the first
n the UK. Not only was
quipment shown but it
o used to demonstrate the
ity of the company's
e packages for contour-
drawing and automatic
ducing flow-charts.

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results of research
c memories being under-
t their Stevenage fac-
his disc is designed to
to 10 times the packing
of conventional EDS.

research projects on
ncluded the optical
r store, also from ICL,
number of com-
ions items, none of im-
relevance to the com-
dustry, by IBM.



An engineer explains the operation of the HSP 3502 chain printer which was one of
the main exhibits on the Potter Instrument stand. Also on show was the SC 1030 single
capstan transport system and the BIT 480 general purpose computer.

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THE GROWING WORLD OF GRAPHICS

THE International Symposium on computer graphics, organised by Brunel University's Department of Computer Science, was the first such symposium held outside the United States and was supported by over 400 delegates and nearly one million pounds worth of manufacturers' equipment was on display.

Its aim was to encourage the wider use of graphic terminals throughout industry, commerce, research and education, and had, therefore, been directed towards potential computer users — technical directors and management.

Because of a large response the conference had to use three lecture theatres in the new lecture block at Brunel with presentation by closed circuit television to delegates in the two subsidiary halls.

The first day of the conference dealt in general terms with the subject of computer graphics, the techniques, developments and possible uses. Pre-prints of the papers had been previously distributed to delegates.

It was during the second day that interest really quickened; it was a reflection of the success of the organisers' aim that there were too many questions asked for the time available.

After the conference proper, a number of the world's foremost computer graphics specialists spent two days discussing problems such as standardised computer graphics languages and low cost graphic equipment.

The first morning's session was devoted to what was essentially the manufacturers' side of computer graphics and to the basic introduction.

Professor G. Black, of Manchester University, remarked that computer graphics was on the point of being accepted and applications were beginning to be found. When really started, it would "go like a bomb" as computers did in the early days.

The introductory talk, given by S. M. Matsa of IBM, was entitled "What has computer graphics to offer?" Matsa thought that computer progress had been hindered by the lag of input/output devices behind other hardware development and that the dual modern advance of computer graphics, coupled with time sharing machinery, was the answer. In this way computers would find new applications as well as greatly increase the effectiveness of dealing with old ones. Matsa outlined some possible future developments and gave an extensive list of application areas.

"Computer graphics hardware techniques" was the paper presented by D. R. Evans of RRE Malvern, who explained very simply how the pictures were produced, for the sake of those delegates who were not electronics engineers. In his paper, presented with the talk, he went into details of what techniques were available and what advantages were to be gained from each.

For input, keyboards, rolling balls, light pens, Rand Tablets and touch wires were commonly available, with variants on each. Of possible graphical output devices the cathode ray tube display was the most common, —he described the various types and other display screens such as direct view storage tubes, dark trace displays and matrix displays.

Of the latter, Evans said that the most promising line of research was that on gas discharge tube displays, which have desirable storage characteristics. The problem was their manufacture, and their poor resolution. In answer to a question, Mr Evans gave a figure of a sixteen by sixteen matrix per square inch as the currently maximum possible packing density.

S. Bird of the Marconi Company, talking of computer graphics software techniques, outlined the use of display files, and data structures, and spoke of the particular ring structure which he had developed.

"Interactive computer graphics" was the subject which A. R. Rundle from ICL dealt with, and he explained that the most sophisticated of the computer graphic techniques allow usage to be interactive, that is, data can be fed in and read out from the computer at the same terminal. The fast re-

A report on the International Symposium on Computer Graphics held at Brunel University's Department of Computer Science.

velopments in the equipment and the likely pattern of development in the future in the industry.

Murray Ruben discussed possible ways of lowering the cost of graphic terminals. He considered that the best approach was to perform as many functions as possible by software, and remove the problem of refresh by using direct view storage tubes. In such a manner terminal costs could be reduced below \$10,000 (as opposed to \$50,000-\$100,000), but at the expense of system response time and power.

The second day was set aside chiefly for reports of user experiences, and was really the meat of the conference.

The University of Illinois have been investigating the use of graphics terminals to write programs. Professor C. W. Gear reported on progress. The idea was to set up a flow diagram on the screen using conventional blocks, enter instructions into the blocks and then instruct the computer to run the program. It was possible to have the various blocks blinking as they were being executed, and thus follow the progress of the program. The advantages were a considerable saving in programming and debugging time.

R. Elliot Green, of Scientific Control Systems Ltd, talked of remote computer graphic terminals. The greater the distance between terminal and computer, the more difficult it is to maintain high data transmission rates. Over telephone lines the data rate is slowest of all. For this reason, a fully interactive vector generating display unit cannot be used far from the computer. He talked about the types of terminal that could; these were mostly alpha-numeric terminals. He reviewed the advantages that

alphanumeric CRT devices had over conventional teletypes.

The first really commercially viable application reported was that of the Ministry of Defence (Navy Department). According to A. E. Fitz, senior supply and transport officer, the use of alphanumeric terminals for managerial access to computer records reduced the number of interdepartmental telephone calls and proved easily operated, reliable mechanisms of undoubted benefit to middle and junior management.

Any person requiring information on stores simply typed a file number, and a question number and in times between one and two seconds, had the information asked for.

Function headings

P. E. Walter of West Sussex County Council, described the use of fully interactive computer graphic terminals for the designing of buildings. Parts of buildings had been classified under certain function headings, and the available building shapes and materials had been held in store together with details of cost, thermal insulation properties and availability. The architect could select the shapes he required with immediate access to the feasibility of using them, and could calculate material costs and heating costs on the spot.

At the end of the talk, a number of delegates wanted to know how the system had been programmed. Walters replied that they had written it themselves, although the assistance of IBM the manufacturers of the equipment had been invaluable.

Two scientific applications were next described, both from nuclear physics laboratories. F.

L. Larkin of the Culham Laboratory, considered that the great advantage that could be gained by a scientist using a graphics terminal was that of seeing a pictorial representation of a theory. Since the human understanding of difficult concepts was greatly facilitated by pictorial representation, the graphic terminal was that of seeing a pictorial representation of a theory. Since the terminal was an ideal tool with which to operate. The result was that quite unexpected phenomena was discovered,—Larkin actually described it as a "serendipitous technique," and gave several examples of how it had so been used.

P. M. Blackall of CERN, Geneva, also gave examples of how graphics had been used in particle physics, chiefly the analysis of particle tracks in cloud and spark chambers. Both Larkin and Blackall emphasised the importance of graphical representation of complex functions.

The fourth session looked at Rolls-Royce evaluating the use of fully interactive terminals for certain aspects of aero-engine design. Scorning the approach of some companies, B. T. Torson, head of the Computer Aided Design team at Rolls-Royce, said that they had written no demonstration programmes, and in order to evaluate the technique most effectively, had modified existing simple programmes written in FORTRAN.

The first program run had been a disc design problem. The design parameter was the thickness of the disc at different radii. The existing program computed the minimum weight shape of the disc for given thicknesses. Several runs had been necessary on batch processed programs, taking up to a week,—with the use of a graphic console, typically, the time had been cut to half an hour, and with more information output.

Another part of an aero-engine had been treated in a similar way in a second program with the added facility of comparing the computed result design and manufacturing standards.

The next step in the Rolls-

Royce program will be in the design of turbine blades with the aid of the IBM sketching facility. Torson envisaged that this would involve hours of console time.

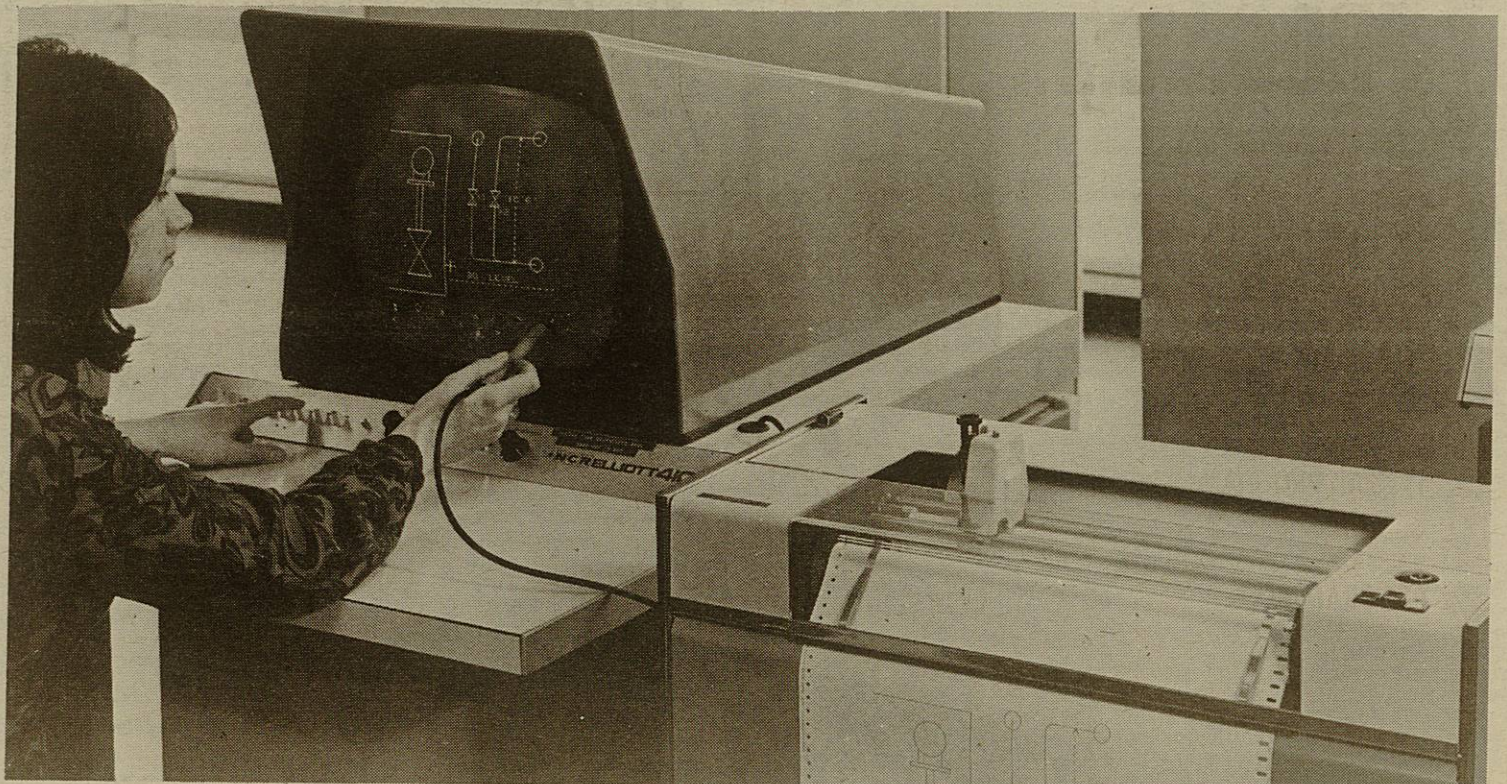
In concluding, Torson considered that the main advantages to be gained from the use of computer graphics was the saving in time, the fact that the computer user need no longer be a computer specialist and that experience could be stored in the computer in the form of geometric shapes.

Another major design field utilising computer graphics, is electronics. D. M. McDouall dealt with STC's applications. STC have both written programming packages of their own and used IBM packages in their work. IBM's ECAP package had been found useful for circuit analysis, replacing time-consuming bench testing work. A program written by themselves had been used to assist in designing equaliser circuits for telephone land lines, in which essentially the land line distortion and filter characteristics are superimposed on the screen, and the filter design eventually selected by a process of human judgment and observation. Graphic techniques had also been used at STC for designing printed circuits.

The final talk was given by R. A. Chambers who has been working with Professor Michie at Edinburgh University on producing "intelligent machines." Computer graphics has been used as an interface between man and machine in the experiments. In this way both man and machine may be compared in their ability to learn to solve the same problem.

As part of their research, Michie and Chambers simulated a pole and cart system in the computer. A pole is balanced on a moving platform, and the problem is to control the cart so that neither the pole falls over nor the cart run off the rails. The progress of the cart was followed on a graphics console. In testing both human and computer efforts to learn the technique, the visual representation of the screen had been an essential feature of the experiment.

The proceedings of the Conference will be published in book form by the Plenum Publishing Company in what the organisers hope will be record time, an estimated five to six months.



AN NCR Elliott 4100 graphic display actually in use. It is being used for the build up of pipework layout to be used in a chemical plant. In this instance the operator uses a light pen for picking up, placing and correcting the appropriate symbols. Also, in conjunction with the row of display switches on the right of the

console, the light pen is used for orientating and scaling the symbols. The numeric data related to the design are automatically calculated by the 4100 computer and displayed on the screen. To the right of the unit is a Benson-Lehner graph plotter giving a hard copy of the display on the screen.

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Recent experience in the Management of people engaged in the development and presentation of Courses and Seminars at this level is essential. The post is a Key position in the Centre's organisation structure, and represents an exceptional opportunity. The appointment will be made in the range £2,800 - £3,500.

SENIOR CONSULTANTS

There are a few vacancies at this level for people who are already involved in Senior Management education in computing with the allied management science and applications topics. The range of the NCC programme is as shown above, and the opportunities are particularly challenging and attractive. The whole basis and approach to training at this level is under examination, and live computer-based techniques will be employed to the fullest extent.

Appointments will be made in the range £2,250 - £2,950.
Write or phone for application form, or apply with full personal details, to: The Controller, quoting CW/43510,
THE NATIONAL COMPUTING CENTRE
QUAY HOUSE
QUAY STREET, MANCHESTER, 3

CONSULTANCY DATA PROCESSING

If you are endowed with a pioneering spirit and would like to direct the growth of our data processing advisory service still in its formative stage, we would like to hear from you.

We would expect you to have:
Extensive experience in systems development.
A good knowledge of advanced computer technology.
A conceptual and commercial approach to business problems and understand the contribution computers can make to decision-making in all areas of commerce and industry.
Ability to educate and persuade potential clients of the benefits both of our services and computers.

Earnings will consist of a high basic salary, plus an attractive profit-sharing scheme.
Write in confidence to: The Principal DONOGHUE MANAGEMENT ASSOCIATES P.O. Box 389, BIRMINGHAM 13

SYSTEMS ANALYSTS and PROGRAMMER

Peters Ltd., a member of the Hawker Siddeley Group, is engaged in the manufacture of industrial and marine diesel engines, transport refrigeration equipment, air compressors and generating sets. The company has 2,000 employees in factories at Staines, Middlesex, and Hamble, Hampshire.

SYSTEMS ANALYST

A Systems Analyst is required at each of the company's factories with responsibilities for developing systems within the accounting, production control and spares functions.

Experience in designing and implementing commercial computer systems in an engineering environment and a knowledge of the ICL 1900 range of computers would be an advantage.

PROGRAMMER

A programmer is required at the company's Staines factory with at least one year's programming experience on an ICL 1900 computer using PLAN. A knowledge of COBOL would be an added advantage although not essential.

Please apply, giving full details of age, experience, salary, to:
The Personnel Manager
Peters Ltd., Staines, Middlesex



Senior Programmers Programmers and Computer Operators

(Sunbury-on-Thames)

E.E.C. 4.30 COMPUTER

Vacancies have arisen for Senior Programmers and Programmers for interesting work on an E.E.C. 4.30 tape/disk installation with off-line data transmission at the Company's Sunbury-on-Thames establishment. Opportunities will arise during 1969 for suitable staff to transfer to a second Computer Centre utilising similar equipment which will be located at Washington, Co. Durham.

Applications are invited from Programmers with several years' practical experience which should include third generation equipment and the use of COBOL or other high level language.

Applications are also invited from Computer Operators, preferably familiar with the above or similar equipment.

Salaries will be individually negotiated and will reflect the importance we attach to these positions.

The Company offers an attractive range of fringe benefits.

All applications will be treated in confidence and should be made to:



Mr. A. G. R. Stainer,
RCA GREAT BRITAIN LIMITED,
Lincoln Way, Windmill Road,
Sunbury-on-Thames, Middlesex.
Telephone Sunbury-on-Thames 85511.

A SUBSIDIARY OF RADIO CORPORATION OF AMERICA

PROGRAMMERS

A challenge to D.P. professionals
We are pioneers in computer Production Control systems, and are embarking on a Dynamic Manufacturing Control system, utilising a Honeywell 1250 Disk/Tape configuration.

Work has already commenced on this project and we now wish to augment our existing Management Services staff at the following levels.

SENIOR PROGRAMMERS

Applicants must have at least two years' experience of programming which includes, COBOL Programmes and a thorough knowledge of Honeywell Operating Systems.

SYSTEMS PROGRAMMERS

Requiring two years' experience of programming a Honeywell computer, an ability to specify programmes clearly, and an interest in developing systems techniques.

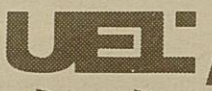
PROGRAMMERS

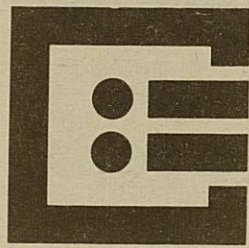
The experience required for these positions will be at least one year's programming using COBOL.

Please write, giving details of experience to:
The Senior Personnel Officer (Ref: 105)

ULTRA ELECTRONICS LTD.

Western Avenue
London, W.3





Computer
Technology
Limited

Senior Programmer

Computer Technology require a senior programmer to work on the implementation of an intermediate programming language. He should ideally have experience of both compiler and assembler design and be interested in the intermediate language/overall operating system relationship.

The Modular One Computer System is specially designed for flexible and efficient software.

The Company is growing extremely rapidly and there are excellent prospects.

Write to the Personnel Manager requesting an application form at
Computer Technology Limited
Eaton Road
Hemel Hempstead, Herts
Hemel Hempstead 2171

Programmers

The continuing enhancement of the 1900 Series and the recent addition of the 1908A requires the further expansion of our development teams in Stevenage and Manchester. The 1901A through to the 1904A use multilayer circuits in conjunction with TTL integrated circuits. The 1906A and 1908A each demands 12-layer multilayer circuits with the fastest ECL integrated circuits that can currently be produced.

As a programmer, your work can be backed by a complete design automation facility including a 1904 and 1906 computer; a suite of programs containing 200,000 instructions and two Gerber automatic draughting machines—with another Gerber and a 1904E computer soon to be added. And you will have the very best technical facilities in ICL's modern development laboratories—another new one has just been opened in Manchester.

If the problems involved interest you—as they must if you are a computer professional—and if you are keen to be where the new things are happening, look at what we can offer. One thing is certain. If you're good at your job, we'll pay you well and give you all the opportunities you would expect from this new international Group.

Executive Programmers

To join system design teams working on such problems as local and remote peripheral handling, dual processor systems, "fail soft" design etc. Minimum requirements—2 years' general programming experience. (Stevenage and Manchester.)

Test Programmers

To develop comprehensive and searching test programs to check correct operation of computer systems and diagnose fault conditions. Minimum requirements—12 months' experience of programming or logic design. An engineering background is desirable. (Stevenage and Manchester.)

Design Automation Programmers

To provide computer aid for design and production processes. The work ranges from high-level simulation and design algorithms to output for numerical control devices. Minimum requirement—12 months' programming experience, preferably in machine code. An engineering background is desirable. (Stevenage and Manchester.)

Simulation Programmers

To work with project design teams to produce program models for simulation of logic designs. This work involves the use and development of specialised high-level languages. Minimum requirement—at least two years' experience of programming or logic design. (Stevenage and Manchester.)

Program Analysts

To examine the real behaviour of programs in the user environment, evaluating problems associated with instruction sequencing, data flow and hardware utilisation, etc. against system design requirements. Minimum requirement—at least two years' experience of programming or logic design. (Stevenage and Manchester.)

Senior Programmer

To develop a new business management language for the 1900 Series. Several years' experience including Fortran with the breadth of outlook needed to devise programmes to meet a wide variety of generalised management problems and preferably with experience in planning, simple modelling operations, or language development. (Stevenage.)

Write: To the location of your choice, quoting reference CW800/1

Stevenage: C. W. Squires, ICL, Cavendish Road, Stevenage, Herts.
Manchester: J. Harrison, ICL, Wenlock Way, West Gorton, Manchester 12.

Phone: You can record a request for an application form on our answering machine 01-788 0640—any time, day or night.

The Computer Industry **ICL**
International
Computers
Limited

DERBYSHIRE COUNTY COUNCIL County Surveyor's Department

Applications are invited for the appointment of

SENIOR ENGINEER

(Computer Design) within SO. Grade (£2,005-£2,335 p.a.), to be responsible for developing, programming and processing of highway, structural and allied engineering programmes for the County Council's I.B.M. 360 machine. The Department is engaged on a large and expanding highway programme and has set up at Matlock a Sub-Unit of the Midland Road Construction Unit. Applicants should be qualified Engineers with experience in the application of the latest computer design techniques.

The appointment is subject to the National Scheme of Conditions of Service, Superannuation and medical examination, with a Casual User car allowance. Schemes for assistance with removal expenses and payment of lodging allowances are available.

Application forms from the undersigned, quoting Ref. CW, to be returned by 26th Aug., 1968.

G. Race
County Surveyor

County Offices
Matlock
Derbyshire
DE4 3AG

COMPUTER OPERATOR

required for the Company's Ilford headquarters. Applications are invited from young men with 6/12 months' operating experience of ICT 1900 series computers. An attractive salary will be paid and there are excellent staff benefits.

Apply quoting ref ILF/531/E, to the Staff Manager, The Plessey Company Limited, Ilford, Essex.

VAUX & ASSOCIATED BREWERIES LIMITED Sunderland, Co. Durham

COMPUTER OPERATOR

required for Honeywell 120. Applicants should have at least six months operating experience on a magnetic tape installation. Apply with full particulars to **E.D.P. MANAGER.**

UNIVERSITY OF EXETER LECTURER/ASSISTANT LECTURER IN NUMERICAL ANALYSIS

Applications are invited for the post within the Department of Mathematics of Lecturer/Assistant Lecturer in Numerical Analysis tenable from the 1st January, 1969.

Salary scales:
Assistant Lecturer — £1,105 x £75-£1,180 x £80 — £1,340 per annum.
Lecturer — £1,470 x £90-£2,010 x £85-£2,180 x £90-£2,630 per annum. (Efficiency Bar £2,180.)

Initial salary will depend upon qualifications and experience.

Further particulars may be obtained from the **Secretary of the University, Northcote House, The Queen's Drive, Exeter.** Closing date for applications (eight copies: one copy from candidates overseas) 10th September, 1968.

Senior Computer Operator

There is a vacancy in the Computer and Tabulator Department for a Senior Computer Operator to provide supervision for shift working on the computer. The Senior Operator will control a shift of three operators and arrange sequencing and supervise the running of jobs on the computer.

Candidates must be aged at least 22 with a good knowledge of computers and with at least twelve months' computer operating experience on a multi-programming machine.

Applications should be sent to C. J. W. Righton, Group Personnel Department, Head Office, Prescott Road, St. Helens.



PILKINGTON



COMPUTER MANAGER

Autodata Limited, a member of the Hanger Investments Group, are seeking a capable and ambitious Computer Manager who will be responsible for the operation of their computer, at present a 1901 tape configuration, and for the data preparation department. Experience of the control of operations and data preparation staff is necessary and a good level of education is required.

The Company has already embarked upon an expansion programme and the applicant will be required to work in this environment. Initial salary will be up to £2,250 based on age, experience and the company offers generous fringe benefits.

Please enclose a brief curriculum vitae when requesting an application form.—

General Manager
AUTODATA LIMITED
187 BROAD STREET, BIRMINGHAM 15

SCOTTISH CO-OPERATIVE WHOLESALE SOCIETY LTD.

SYSTEMS ANALYSTS £1,600-£2,500
PROGRAMMERS £1,300-£2,200

We are a large distributive and manufacturing organisation with an annual turnover in excess of £90m. having completed our first phase of recruitment now wish to recruit additional computer personnel as above to operate our I.B.M. third generation system.

We intend to expand our present systems into warehousing, automatic inventory management, local and remote order entry, manufacturing control and to develop a management information system for locations throughout Scotland.

● **SYSTEMS ANALYSTS:** Several years' experience in the use of a computer to solve management problems, preferably (but not essential) having a degree or professional qualifications.

● **PROGRAMMERS:** Several years' experience in second or third generation computers preferably (but not essential) having a degree or professional qualification.

Location will be in Glasgow in a newly constructed office block which offers first class working conditions. Salary will be on above scales with placing according to experience.

Applicants should submit brief details of career to date to Society Personnel Manager, Centenary House, 100 Morrison Street, Glasgow, C.5, not later than 1st September, 1968.

Systems Analysts - Management Consultancy

We are a rapidly expanding London based firm providing Management Consultancy services throughout the U.K. with associate firms in North America.

We have a number of positions in our Computer Department for experienced Systems Analysts and Programmers.

Age 25-35, candidates should hold a university degree or equivalent, have had experience in file organisation, disk storage devices and have used disk-resident operating systems.

Starting salaries are high and dependant on qualifications and experience. Generous holidays and fringe benefits.

Apply in confidence to J. L. G. Beatty, Ref: BB105, McLintock Mann & Whinney Murray, Granby House, 95 Southwark Street, London, S.E.1.

CHIEF PROGRAMMER/ SYSTEMS ANALYST

An opportunity exists for a Chief Programmer/Systems Analyst with several years' experience of disk and/or tape programming to install and develop an I.B.M. 360 Model 25 Computer — mixed tape and disk system using D.O.S. and Cobol.

The conditions of service include House Purchase Assistance, Pension Facilities and free Life Assurance. Salary in the range £1,750-£2,250. Applications in writing providing detailed information should be addressed to the General Manager, BRADFORD INSURANCE COMPANY LIMITED, Insurance Buildings, Peckover Street, Bradford 1.

LONDON BOROUGH OF BARNET HENDON COLLEGE OF TECHNOLOGY

(part of proposed Polytechnic) DEPARTMENT OF MANAGEMENT AND BUSINESS STUDIES

LECTURER GRADE II IN ACCOUNTING

Applications are invited for a Lectureship in Accounting and/or Systems Analysis. Candidates should have a university degree, and/or a professional qualification and experience in Accountancy or Systems Analysis.

Salary scales: Lecturer II — £1,725-£2,280 p.a. plus £70 p.a. London Allowance.

Application forms and further particulars from the Registrar at the College, The Burroughs, Hendon, London, N.W.4, to whom they should be returned within fourteen days from the date of this advertisement.

IBM 360 FOR HIRE FROM £17 PER HOUR

A well-established IBM 360 installation situated in South London offers time for hire for ad hoc or regular bookings. The charging rates vary, dependent upon the requirements and how this fits into our existing work.

CONFIGURATION:

Model 30. 32K core. 4 x 2311 Disk Drives. 1 x 2540 Card Reader/Punch. 1 x 1403 Printer, 1100 l.p.m. with UCS. Floating Point. Decimal arithmetic.

FACILITIES:

Punching and Verifying, Systems and Programming Support, Reference Manuals, Operating Support, Collection and Delivery Service in Greater London, Current Level of DOS, Card Sorting/Collating/Reproducing/Interpreting, 1401 Compatibility, Client Work Rooms.

Please apply, in first instance, to Box No. 5739, Computer Weekly

CANTRELL AND COCHRANE (SOUTHERN) LTD.

SENIOR COMPUTER OPERATOR

A young and fast moving Computer Team require a Senior Operator to work on our NCR/ELLIOTT 4100 Computer.

The successful candidate must have had at least six months experience, and will have spent the majority of this time operating a Magnetic Tape system.

Salary will be commensurate with qualifications and experience. Applications in writing, giving full details of career to date should be forwarded to:

Mr. N. J. Askew
CANTRELL AND COCHRANE (SOUTHERN) LTD.
Hanworth Road
Sunbury on Thames, Middlesex

Computer Operations Manager Section Leader Programmer

We are a Department providing an engineering computing service to a large Company in a major industry in the Stevenage area. We need two able, experienced individuals for the key posts shown below. Salaries will be negotiated but in neither case is likely to be less than £2,000 per annum.

- 1. Computer Operations Manager** to be responsible to the Departmental Manager for the day-to-day operation of a large I.C.L. 1900 series Digital Computer engaged in a wide field of scientific and engineering applications on a 3-shift working basis currently employing a staff of 26 computer and machine operators and control staff. This post calls for ability to liaise harmoniously with programming staff and Company users at all levels and a capacity for rapid, decisive and correct decision making.
- 2. Section Leader Programmer (Analogue Computer)** fully conversant with the concepts of analogue simulation, operation of linear and non-linear elements, simulation of discontinuous and arbitrary functions, rational programming of ordinary differential equations, amplitude and time scaling, programme check-out procedures. Required to lead and supervise a small section of programmers who have available to them a range of computing equipment, including two E.A.L. 680 systems.

Applications to Box AC 1549 Davidson, Pearce, Berry & Tuck Ltd., 15/17 Marylebone Road, N.W.1.

The Rank Organisation

Rank Taylor Hobson employ some 1,100 people engaged in the design and manufacture of specialised precision measuring instruments, optical systems, and television lenses for world markets.

The Scientific Computer Programming Section at Leicester provides a professional analysis and programming service to scientific users in the Lenses and Instruments Research and Development Department. The available facilities are built around a well established I.C.T. 1905 computer having 32K store, magnetic tape and exchangeable disc store.

We require a

scientific systems analyst

Applicants should have a good Mathematics degree with sound experience in Numerical Techniques, the mathematical analysis of physical problems and the application of computing methods to their solution. The successful applicant would be able to record analysis for scientific programmers and guide them when necessary. The analyst would be required to carry out detailed system development after consultation with the scientific computer users.

The basic application fields are currently Optical and Instrument design, but ability and interest in mathematical analysis is more important than specialised knowledge in a limited field. A working familiarity with the main programming language FORTRAN is essential. Ref. S.S.A.

This section also has a vacancy for a

scientific programmer

with sound mathematical knowledge and a few years' experience of scientific programming in a modern computing environment using FORTRAN IV and some machine code. The ability to translate detailed mathematical and system analysis into acceptable programmes is essential. Ref. S.P.

Applications quoting reference, age, qualifications, experience and present salary should be addressed to:



The Personnel Manager
Rank Taylor Hobson
Stoughton Street, Leicester. LE1 9JB

AUTOMOTIVE PRODUCTS COMPANY LTD. BANBURY

MACHINE ACCOUNTS CONTROLLER

We are looking for a man with the drive and ability to control the day-to-day operations of a large punched card installation. He will be responsible for ensuring that all the existing time schedules for job completion are constantly maintained, including various analyses that are required daily by higher management.

Although some technical ability is a must, the accent is more on the administrative ability of the person we are seeking.

The installation is a large one producing a wide range of statistics and analyses, etc., on modern I.C.T. Ltd. equipment including a 1901 Computer.

The successful applicant will be required to work to a large extent on his own initiative and he will report direct to the Computer Manager.



Applications, giving details of age, education, qualifications and experience, should be addressed to the Personnel Manager, Automotive Products Company Ltd., Southam Road, Banbury, Oxon.

EAST SUSSEX COUNTY COUNCIL

Applications are invited for the following posts in the Computer Section of the Department of the County Treasurer. The computer installation comprises an I.C.T. 1902 with 16K core store, paper tape and card input, magnetic tapes and disc storage.

SYSTEMS ANALYST

—Salary scale £1,725-£2,105

Applicants should have had considerable experience in both financial and non-financial work as a systems analyst and some local government experience would be an advantage. The projects to be undertaken in the next few years will be mainly non-financial.

OPERATIONS SUPERVISOR

—Salary scale £1,435-£1,665

Applicants should have had considerable experience of supervising and operating a computer of similar configuration.

Financial assistance towards removal expenses and an allowance for temporary accommodation in appropriate cases.

Applications, stating age, qualifications and details of experience, together with the names of two referees, should reach the County Treasurer, County Hall, Lewes, Sussex, by 19th August, 1968.

COUNTY BOROUGH OF BLACKBURN Experienced PROGRAMMER

required for an installation comprising an ICT 1901 8K processor, magnetic tapes and paper input. Salary according to experience within the range £1,055-£1,485. Applications, giving full details, to: Borough Treasurer, Town Hall, Blackburn, by 24th August.

UNIVERSITY OF DUNDEE COMPUTING LABORATORY COMPUTER OPERATORS COMPUTING ASSISTANTS

Applications are invited for the above posts from persons with previous operating experience and from others anxious to work in a Computing Laboratory.

Appointments will be made in the Technician and Junior Technician grades according to qualifications and experience.

Operators will be given the necessary training on the Laboratory's Elliott 4130 computer, which has magnetic tape and disc backing stores, and multi-access consoles.

Computing Assistants will be required to prepare data for the computer on card and paper tape equipment, and also to assist in the reception and despatch office. Training in computer operating, with a view to promotion to the position of Operator, will be given.

Salary scales:
Technician (Computer Operator): £722-£1,007
Junior Technician (Computing Assistant): £352-£595

Applications, in writing, stating age and qualifications, should be sent with names of two referees to: The Secretary, The University, Dundee, by 5th September, 1968.

ARGUS

12 Fouberts Place
London, W.1
01-437 0889

COMPUTER PERSONNEL APPOINTMENTS SERVICE for experienced staff at all levels

SYSTEMS ANALYSIS

Our present development programme has caused us to expand our Systems Analysis Department. We require Project Leaders and Systems Analysts.

The Company operates a Leo III and we are planning for the installation of a larger third generation machine in the second half of 1969.

Project Leader: Salary range £2,000-£2,250. To lead teams which will plan and implement integrated information systems for our Consumer Products and Engineering Divisions. Applicants should have around three years systems experience, preferably production orientated, and latterly should have had product responsibility. Age range 25-35 years.

Systems Analyst: Salary range £1,400-£2,000. Analysts are required for the above teams and for other systems work. Applicants should have about two years experience of systems analysis or O. & M. Age range 23-33 years. The salaries quoted are starting salaries and more will be paid for applicants of exceptional ability. All applicants should be graduates or professionally qualified.

Please write giving full details of your education and experience to:—

The Personnel Officer (Ref. 103)
The Ever Ready (Co. (G.B.)) Ltd.
1255 High Road, Whetstone, London, N.20

COMPUTER EMPLOYMENT BUREAU

We are always looking for men for the jobs and jobs for the men (and women). All levels of experienced Computer Personnel.

For personal service contact:

Marion Lewis, Ref. ML22, 93/97 Regent Street, London, W.1
Tel. 01-437 0534 and 734 2060

For Classified Information

Tel. 01-928 3333

COMPUTER PROGRAMMERS

You may have read BEA advertisements during the past twelve months inviting applications for the posts of Computer Programmers within our 'BEACON' Real Time Network at West London Air Terminal. Increasing demand by Management for new computer systems has meant a continual expansion of programming teams to cope with the volume of work, and rapid promotion for those able to take a leading part.

Our seat reservations system has been working for three years now, and some 142,000 transactions are executed daily. We have recently added the first elements of the passenger check-in system which is planned for full operation later this year. Now we have embarked upon a cargo project to cater for the needs of this rapidly expanding sector of our business.

We need Programmers with one or more year's experience. The system is designed to run on our duplicated UNIVAC494 central processors and there is a wide range of peripherals and communications equipment to handle. The utilisation of new and advanced programming techniques added to the absorbing interests of the projects in hand offer an insight into an increasingly important aspect of computing. The tasks being undertaken demand a high calibre of programming and a professional approach.

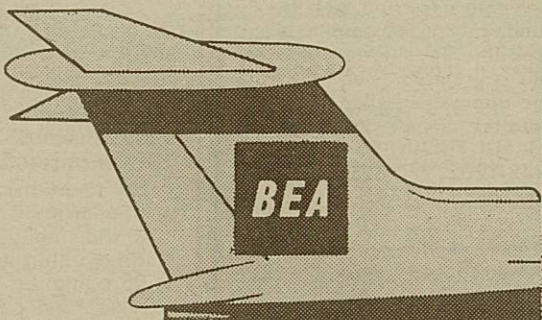
Salaries commensurate with experience will be offered, and there are good prospects of further advancement by internal promotion.

For more information and application form, please write to the Chief Programmer, (CW) BEA, West London Air Terminal, Cromwell Road, London, S.W.7, or telephone 01-370 4255 ext. 2195.

If you would prefer in the first instance to talk informally with BEA programming management staff, PHONE 01-370 4255 any time between 1700 and 1900 hours on

MONDAY 19 AUGUST
TUESDAY 20 AUGUST
WEDNESDAY 21 AUGUST

and ask for 'BEACON interviewers'; on calls from outside London we will accept reversed charges.



CANTRELL AND COCHRANE
(SOUTHERN) LTD.

PROGRAMMERS REQUIRED FOR NCR/ELLIOTT 4100 INSTALLATION

Candidates should have at least one year's experience in commercial programming, preferably at assembler level, and experience of magnetic tape programming.

Salary will be commensurate with experience and qualifications.

Applications in writing giving full details, should be forwarded to:—

Mr. N. J. Askew
CANTRELL AND COCHRANE
(SOUTHERN) LTD.
Hanworth Road
Sunbury on Thames, Middlesex

PORTSMOUTH CORPORATION

(a) Systems Analyst/ Programmers

(Grade S.O. (bar) - £1,780 to £2,170)
— two posts

(b) Senior Programmers

(Grade A.P. 3/4 - £1,265 to £1,715)
— three posts

An I.B.M. 360/30 (32K, 3 discs, 2 tapes) is on order to replace the existing 1401 system. Successful applicants will be required to work in the first instance on the transfer of financial routines to the new computer and subsequently on the extension of computer developments to new applications.

Commencing salary within the grades is dependent upon qualifications and experience. Applicants for posts (a) should have not less than two years' experience and must have been responsible for implementing at least one major system. Attractive working conditions; assistance with housing requirements and removal expenses.

Applications giving full details of experience and qualifications and naming two referees should be sent to the City Treasurer, 1 Clarence Parade, Portsmouth, by 23rd August, 1968.
J. R. Haslegrave
Town Clerk

FORTRAN PROGRAMMERS

£2,000 PLUS

required for Manchester Area

VERA SUGG

20 PRINCES ST., MANCHESTER, 1

Tel: 061-237 4548

Computer Programmers

A LARGE PROGRESSIVE RETAILING ORGANISATION, based in Central London, requires the following staff to take an active part in the development of their existing computer activities on a new NCR Century 200 series.

The personnel will be part of a small but experienced team concerned with a large configuration and its application to highly sophisticated retail systems including advanced merchandising techniques.

Senior Programmers

With at least 2 years' experience and a knowledge of a high level language preferably NEAT or COBOL.

Programmers

With at least one year's experience. NEAT and/or COBOL experience would be an advantage.

As part of the policy of this forward-thinking organisation, attractive salary scales, first-class working conditions and fringe benefits are offered to those selected.

This is an excellent opportunity to work in an advanced EDP orientated environment.

Applications should be addressed, in the first instance, to:—

Mr. E. B. Garsed, Manager, NCR Training Centre, Ruislip Road East, Greenford, Middx.



Please quote reference 5095

PROGRAMMERS

PROGRAMMING SUPPORT LTD., the rapidly expanding Midlands Bureau, requires FULL- and PART-TIME programmers. The high salaries offered will appeal to those with experience in two or more major languages. Write, giving brief details: Programming Director, PSL, 311 LONGFORD ROAD, CANNOCK

We have some glamorous jobs for talented Lady Programmers

If exchanging words with a computer hasn't proved as romantic as you had hoped, don't despair—read on. We at Honeywell don't chain our Lady Programmers to their machines, we liberate them! Give them leading roles in our demonstration teams. They can even become stars in our top-of-the-bill marketing operations. It's the mod way to meet the right people. And as you would expect from Britain's most talent-conscious computer manufacturers, the salaries are excellent, the conditions tailor-made, and the prospects beguiling. So if you want to put your computer programming and perhaps operating experience to much more glamorous and profitable use, drop a line giving relevant career details to:

K. Molloy
Honeywell Controls Limited
Great West Road
Brentford, Middlesex
or phone 01-568 9191 ext. 468

Honeywell

LANCASHIRE STEEL DIVISION
BRITISH STEEL CORPORATION
SCOTTISH AND NORTH WEST GROUP

The Lancashire Steel Division, requires the following staff for its I.C.T. 1901 installation based at Warrington, Lancs. The development programme includes the provision of management information systems, and Production Control Applications.

SYSTEMS ANALYSTS

Applicants should have proven experience in Systems Design particularly in the Areas of Production Control.

SENIOR PROGRAMMERS

Applicants must have at least three years programming experience, with particular emphasis on 1900 Series Equipment. A thorough knowledge of software, PLAN and COBOL is essential. The person appointed must be capable of organising and running the programming effort.

PROGRAMMERS

Applicants must have 18/24 months programming experience, using PLAN and COBOL.

Salaries for all the above appointments are to be negotiated. Applications giving relevant details of experience, to:

The Personnel Manager
LANCASHIRE STEEL DIVISION
BRITISH STEEL CORPORATION
IRLAM, Near Manchester

GENERAL MOTORS SOUTH AFRICAN

PROGRAMMERS SYSTEMS ANALYSTS PROCEDURE WRITERS WORK MEASUREMENT ANALYSTS

We want to recruit staff for the above appointments. General Motors South African is located at Port Elizabeth—a coastal city of 370,000 inhabitants.

Experienced people interested in emigrating to South Africa will be offered excellent opportunities to work on major projects in Manufacturing, Supply and Engineering Computer Systems.

Good fringe benefits, State-assisted passages and a high initial salary are features of these permanent positions.

Our Associated Company, **Vauxhall Motors Limited**, will be handling recruitment on our behalf.

Please write to the **Staff Employment Manager, Vauxhall Motors Ltd., Luton, Beds.**

Interviews will be conducted by the Manager of Data Processing at Luton.

WARWICKSHIRE COUNTY COUNCIL

I.B.M. System 360 D.P. Unit

COMPUTER PROGRAMMERS

Applications are invited from experienced computer programmers, preferably with knowledge of 360 assembler, R.P.G. or P.L.I. languages, to work with a team in developing a wide range of financial and non-financial applications.

Commencing salary and grade will be fixed within the range A.P. 2/4 (£1,020-£1,665 per annum) according to ability and experience.

Good working conditions, five-day week, canteen facilities. Give details of age, qualifications and experience, together with names of two referees, when applying to the County Treasurer, P.O. Box 3, Shire Hall, Warwick, not later than 22nd August, 1968.

R. M. WILLIS, Clerk of the Council

Woman Key Punch Operator TEACHER

Wonderful opportunity exists for a fully experienced woman to join a highly reputable American company about to open their first U.K. training school. She will be required to train applicants in key punch operation up to commercial standards. She will have the full backing of the management, superb working conditions in brand new Oxford Street, London offices. Rewards both financially and mentally are excellent.

Please phone me for interview now.

Mrs. Ellatt, 01-437 1072

OPERATORS REQUIRED

for busy Data Preparation Department. Must be experienced with Accounting Machines or Punched Cards. Good education necessary. Minimum age 18.

Apply with full details to:

Miss E. Farrar
Operations Manager
Northern Computer Bureau Ltd.
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IBM 1440; 12k 3 disc units
ICT 1004
IBM 024 Punches
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NCR 500 Installation including punched card input/output and line printer
NCR Elliott 4120
Ultronix P.T. Punches, 360 code
ICT and Punches
Anelex Printer

COMPUTER RESALE BROKERS LTD.

31/33 Bishopsgate, London, E.C.2
Tel. 01-588 4763/4

COMPUTERS AND CARPETS

The Company is situated in the West Riding of Yorkshire and is one of the largest manufacturers of tufted carpets in Europe. At present an IBM 1440 computer system is in operation together with an off-line 1050 data transmission system. Considerable extension of data processing facilities is planned as part of an overall expansion programme which includes the installation of a large English Electric System 4-50 computer in December, 1968, utilising both tape and disc storage devices.

SYSTEMS ANALYSTS

Trained Systems Analysts, capable of controlling a project from initialisation, through systems design, to complete programming specification, are required. They should have considerable data processing experience and be capable of giving instruction to non-computer staff.

Experience of a third generation computer is preferable.

There is a generous non-contributory pension scheme with life assurance benefits, and salaries offered will depend upon experience.

Applicants should write, giving particulars of age, experience and present salary, or telephone (S.T.D. Code) OHU 47 (5581) reversing the charge, to:

Mr. J. Bissell, Data Processing Manager, Brookfoot, Brighouse, Yorkshire.

Kosset Carpets Limited

NCR Software Issue and Distribution

NCR require personnel to work on the:

Preparation — Issue — Distribution — Recording

of Software over a range of equipment—including the new NCR Century Computer which uses the most advanced multi-level software. Applicants should have an operational knowledge of software coupled with an enthusiastic and methodical approach. These positions also carry a high degree of individual responsibility

Write to: Mr. E. B. Garsed, Manager
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Please quote Reference SD

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SALE OF ANALOGUE COMPUTER

Because of their intention to acquire a hybrid computer, the CEGB are inviting tenders for the purchase of their PACE Analogue Computer located at London, S.E.1. It consists of two consoles, type 231 R, fully expanded with 240 amplifiers and air-conditioning plant. Further details may be obtained by writing to the address detailed below, or the matter may be discussed with Mr. R. G. Blake, Telephone No. 01-248-1202, Ext. 6396.

Offers are to be made in writing to the Purchasing Officer (HQ), Grindall House, 25 Newgate Street, E.C.1, to arrive not later than noon on Monday, September 16, 1968. Please note the envelope must be clearly marked in the top left-hand corner "Confidential Tender No. 1277".

The Board does not bind itself to accept any offer and any offer would be subject to contract.

CO-OPERATIVE WHOLESALE SOCIETY

COMPUTER MANAGER

Around £2,500

The Co-operative Wholesale Society is constructing a Grocery Distribution Centre at Birtley, Co. Durham, which will be technologically one of the most advanced of its kind in the world. It will have an ICT 1903A computer, which will be used for on-line control of goods movement in the warehouse and for processing data in connection with the servicing of 1,000 grocery shops. Provision of statistical information useful to customers and the use of demand forecasting techniques are envisaged.

The Computer Manager will be responsible to the Centre Manager for ensuring the correct functioning of the computer in both its on-line and EDP applications. He will work closely with the Operations Manager and the Office Manager.

Although the Centre is not due to commence operations until mid-1969, he is to be appointed immediately in order that he may become familiar with the systems design and programming which is now proceeding.

Generous assistance with relocation; contributory pension. Please write briefly in the first instance, quoting reference FY.82/MG, to the Controller, Personnel Services,

Co-operative Wholesale Society Ltd.

NEW CENTURY HOUSE
CORPORATION ST., MANCHESTER 4



JAEGER

require a

PROGRAMMER

Due to expansion in our Computer Department, a vacancy occurs for an experienced I.B.M. Programmer. Applicants must have had at least one / two years' experience on a 1400 Disc Series machine. Knowledge of a 360 installation an advantage, but not essential, as training will be given.

Applications are invited from young men aged between 21/25.

Five-day week, Canteen, Superannuation Fund. Generous discount on staff purchases.

Assistance given towards removal expenses.

Write for application form to:

Staff Manageress
THE JAEGER COMPANY LIMITED
1 Hansa Road, King's Lynn, Norfolk



PROGRAMMER

RANKS HOVIS McDOUGALL LIMITED are seeking another programmer to join their team at Harlow. We need a graduate with at least one year's programming experience, and a sound knowledge of Cobol and/or System 360 programming. Please write, in the first instance, for a Form of Application to—

The Personnel Manager

RANKS HOVIS McDOUGALL LTD.

P.O. Box 11, Northgate, The High, Harlow, Essex

General Foods Limited

Formerly Alfred Bird and Sons Limited, the British member of General Foods International manufacturers of convenience foods and Maxwell House Coffees

SYSTEMS ANALYST

As a result of a promotion within the Information Systems Department, the Company wishes to appoint a Systems Analyst to join a professional go-ahead team working with an I.B.M. 360/30 disk system.

The Department is now studying sophisticated applications in production planning, inventory control, vehicle scheduling, etc. It has planned a 5-year programme for the implementation of management decision making techniques. These advances will lead to an increase in the machine's configuration.

Candidates for this position should preferably have a minimum of 2 to 3 years systems/programming experience.

The salary for this appointment will be attractive and commensurate with experience. The Company offers the fringe benefits appropriate to its position as a leader in the food processing and marketing industry.

The Company is located in a modern plant and office complex at Banbury, a pleasant market town at the foot of the Cotswolds.

Please write, or telephone, giving brief details of experience and present salary, to:

Personnel and Training Manager
GENERAL FOODS LIMITED
Banbury, Oxon.

ADVERTISERS NOTICE

BANK HOLIDAY ARRANGEMENTS

Will advertisers kindly note that for 5th September issue copy should arrive by 28th August to ensure proofs before insertion.

Latest time for copy is 10 a.m. 3rd September providing space is available.

PUZZLE ANSWER

THIS type of simple "pursuit curve" problem can be solved without getting involved in calculus, as follows:

First, work out how far the missile would have to travel to catch the bomber if they both moved forward in a straight line (in the same direction) — in this particular case, this comes to 30 miles. Add to this total the distance the missile would travel if the bomber was flying directly towards it—this amount to 15 miles.

Dividing the resulting total (45 miles) by 2 gives the actual distance travelled by the missile, i.e. 22½ miles. The missile is going three times as fast as the bomber. Therefore the bomber will fly 7½ miles before being struck by the missile.

SYSTEMS ANALYSTS AND PROGRAMMERS

£1,500-£3,500

Computer Systems International require additional staff to work on a broad range of commercial applications and computer hardware. The CSI Group offers services which include analysis, design and programming of computer systems. The variety of assignments provides significant opportunity for career advancement, together with the possibility of travel to European and Commonwealth countries.

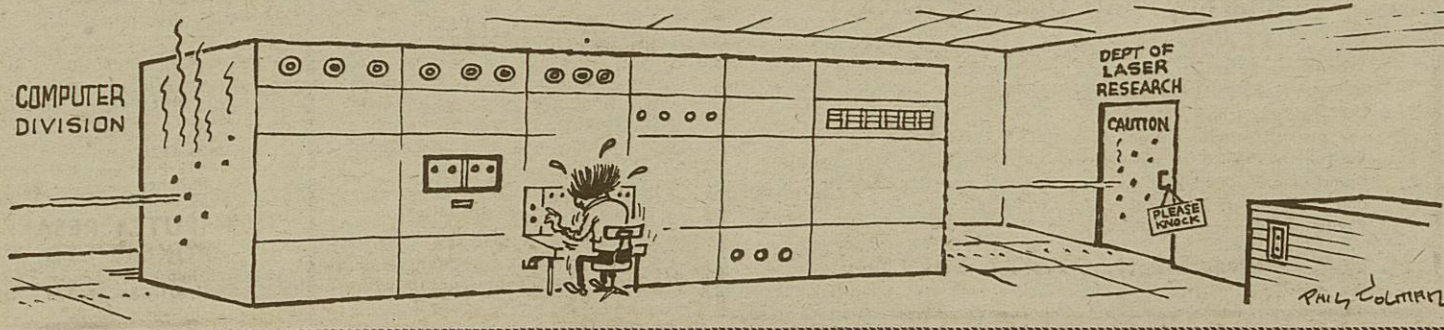
Applications are invited from Systems Analysts and Programmers with two or more years' experience to join our dynamic team advancing the utilisation of computer systems. Successful applicants will be offered top salaries, paid overtime, profit-sharing, four weeks' annual holiday and other benefits. For further information please telephone 01-998 2241, or write to Mr. C. Wootton.

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ED SACK



FIBRE FIRM PLAN FOR ON-LINE LINK

ON-LINE links between the British Enkalon factory in Antrim, Northern Ireland, and their commercial centre in Leicester, are to be established following the installation of an ICL 1902A, at Leicester, next July.

Terminal equipment, including a paper tape reader and a line printer, is to be installed at Antrim enabling the computer to be used to provide services for the entire British operation.

British Enkalon, the UK subsidiary of the Dutch AKU group, manufacture yarns for textiles, carpets and tyres. They are to use the 1902A for accounting and costing routines, stock control, production scheduling and payroll.

A scientific computing feature, a hardware floating point unit, will be included and input/output facilities, in addition to those provided at Antrim, will include a paper tape reader and punch, a card reader and a 600 lpm printer.

ORDERS FROM IRELAND FOR 1900As

THREE further orders for the 1900A series integrated circuit computers have been taken in Ireland by ICL. One is for a 1901A, to be used by Londonderry County Council, another for a 1902A, placed by the Electricity Board for Northern Ireland, and the largest is for a 1903A to be delivered within the next six months to Short Brothers and Harland, the Belfast-based aircraft and ship-building company.

The smaller systems are to be used principally for accounting and administrative functions for the respective organisations to which they are destined—the 1901A being in this respect the first computer to be ordered by a County Council in Ireland (North or South).

When installed the 1903A will be the largest commercial computer in Ulster, and complements an ICT 1300, an Elliott 803B and an Elliott 503 already in operation. It will also provide the users with the means of developing an integrated management information system.

Short Brothers and Harland intend making considerable use of standard ICL application packages and will be doing their own programming.

Leasco software gets ICL top man

THE newly formed software enterprise, Leasco Systems and Research Ltd., has made its first key staff acquisition with the appointment of Peter Hunt, at present manager of ICL's Systems Development Organisation, as managing director.

The appointment makes it clear that the Leasco organisation fully intend to follow through in the software business in Europe.

Leasco Systems and Research Ltd is a subsidiary of Leasco Systems and Research NV, which has been set up in Holland by the American parent company. Dr Alexander Douglas, formerly of CEIR, and Mr Alan Macro are joint managing directors of the Dutch operation.

The Leasco group of companies is headed by Leasco Data Processing Equipment Corp Inc, of New York. Another company Leasco Europa Ltd, registered in Maryland, was set up in January to handle European leasing activities and this is a parallel organisation to the software company.

Mr Hunt joins Leasco on October 1; his resignation from ICL is effective from September 25. Commenting on his resignation an ICL spokesman said: "ICL wishes Peter Hunt well in his new appointment, and takes the opportunity of recording its appreciation of his work on 1900 software."

The acquisition of such an experienced and well known expert in the development of third generation systems places Leasco in a key position for the development of highly sophisticated systems.

Leasco Europa claimed in July to have attracted \$5 million worth of leasing business within 90 days of commencing operation.

With the financial resources of America's largest organisation in this field behind it, Leasco Systems and Research could become an immediate threat to the less firmly established European software houses.

360/30 system expanded

TO enhance the capability of their existing 360/30 16K disc BOS system and to bring in new production and inventory control programs, W. R. Grace Ltd, plastic film packaging material manufacturers, are planning to add a disc drive and an extra 16K core store.

They are also to change from basic operating system to disc operating system and from assembly language to COBOL.

COMPUTER WEEKLY

THURSDAY, 15 AUGUST, 1968

Insurance needs studied by group

THE first meeting of an Insurance Study Group sponsored by Mohawk Data Sciences and chaired by Stan Bootle, of Warwick University, was held in Edinburgh last week. Representatives of 12 insurance companies attended the meeting which was held at the offices of Standard Life Assurance, Edinburgh.

The group is taking an objective look at the data preparation and transmission needs of the insurance industry. The 35 miles of paper tape used each week by some insurance companies can be replaced by a half a mile of re-usable magnetic tape, according to Mr Bootle.

This would be the result of adopting Mohawk's direct recording techniques. Two insurance companies, the Sun Alliance and London Insurance Group, and the Lloyd's Policy Signing Office, have already placed orders for Mohawk equipment.

Further meetings of the study group will be held on September 3 at the Piccadilly Hotel, Manchester, and on October 1 at the Fairfield Hall, Croydon. Full details from MDS Great Britain Ltd, Prudential House, Wellesley Road, Croydon CR9 3LD.

Cybernetics appointments at Brunel

THE first Professor of Cybernetics at Brunel University's Institute of Cybernetics (Computer Weekly, July 4), is to be Dr Frank George, at present lecturer in cybernetics at Bristol University.

Dr George will take up the appointment in September next year after spending some time in the US at Georgia Institute of Technology as a visiting professor.

An appointment as part-time professor to work with Dr George has been accepted by Dr Gordon Pask, and it is hoped that Prof W. R. Ashby, at present at Illinois University, will join them when his appointment permits.

Financial support for the appointment has come initially from the International Publishing Corp which is to provide £70,000, spread over 10 years, to finance the appointments.

Further grants will be needed from other British firms and organisations if the institute is to be established as a permanent feature of the university.

Local authorities order 3200s

THE push-button program controlled visible record Logabax 3200 computer, marketed in the UK by Philips Electrológica from £5,000 upwards, has won three new orders from Hemsforth Urban District Council, Yorkshire, the Strood Rural District Council, Kent, and the Louth Borough Council, Lincolnshire.

Hemsforth will replace manual operations with the 3200 for rate billing and the analysis of departmental expenditure; Strood's machine will handle its payroll and stores accounting; and the Louth 3200 will analyse expenditures and income and look after the stores ledger.



DATTEL DEVELOPMENT AIDED BY SURVEY

THE demand for data transmission facilities over the next 15 years is to be assessed by Scientific Control Systems Ltd, formerly CEIR, under a survey commissioned by the GPO.

This survey, the largest ever undertaken on its subject within the UK, will run for the next eight months in parallel to the GPO's own R and D programme and is expected to yield results vital to the development of the Datel services.

Within the period covered by the survey the GPO have already predicted that demand for data transmission time will become as great as the demand for speech transmission. Since the introduction of the Datel services in the early 1960s some 2,000 transmission terminals have been installed, and as real time operations, particularly for travel and accommodation reservations, become more widespread, so the demand is expected to grow.

A six-man team from Scicon, headed by Philip Hughes, is to conduct the survey covering commerce, industry, research establishments and universities, public utilities and government departments, manufacturers of computers and allied equipment, trade associations and professional institutions.

They will seek to establish how well present Datel services, and those already scheduled for establishment, meet the present demand, what private circuit and public network services will be required for internal and international transmission facilities will be required over the next five, 10, and 15 years, and what new hardware techniques need to be developed.

Other specialist divisions of Scicon will be used to support

Varian HQ at Walton

HEADQUARTERS of a European sales and service organisation, being set up by Varian Data Machines, will be at the Varian offices at Walton-on-Thames, Surrey. Other offices will be in Paris, Frankfurt, Amsterdam, Brussels, Solna in Sweden and Zug, Switzerland.

the work of the survey as required. The consultancy has already gained considerable experience in specific needs for data transmission facilities in undertaking studies for military systems, air traffic control numerical control, and real time systems for inventory control, coding and reservations. They are currently engaged on a study for the Hotel and Catering EDC on a national system for hotel bookings (Computer Weekly, June 27) which may involve a considerable amount of data transmission.

For the bureau side of their activities, which is based on a Univac 1108, the consultancy is to become a major user of data transmission links.

AN unusual training aid is being used by Ron Jones, British Olympic hope for the 100 metres and sprint relay events, to help in his bid for a gold medal in Mexico. An ICL 1901 computer, pictured above with Ron, is fed with details on his training statistics, recorded over 10 years in order to find the ideal number of training in the six days before a competition in order to put up the best performance.

Ron told Computer Weekly: "It's a lot easier than wading through 10 years of diaries on your own. I've tended to pay more attention to the last five years, in order to find the ideal one's strength doesn't increase significantly after the age of 28 and I am almost 34."

"It has more or less confirmed what I already thought: too much work before a competition and my performance falls off, no work or too little and it falls as well."

The computer is Plessey's accounting and payroll machine at Ilford where Ron Jones is chief work study engineer in the Marine Systems Division.

LEO III WORKLOAD FOR HEINZ'S NEW MACHINE

SCHEDULED for delivery in March, 1969, an ICL System 4/50 has been ordered by H. J. Heinz Co Ltd. The £365,000 computer will be installed in a ground floor computer room at Heinz's new administrative headquarters in Watford, Herts, from where it will take over the workload of the company's present system, a Leo III.

The main function of the new computer will be to take over and extend the accounting and administrative functions of the company, including payroll and stock control. Sufficient capacity has also been specified for the new system to allow for the development of operational research and management information systems.

File conversion systems developed by ICL will be employed by Heinz to ensure a smooth changeover between the old and new computers. In addition the

company will continue to use the Cleo language, developed for Leo III, for which a compiler is available as part of the System 4 software.

The System 4/50 ordered by Heinz includes a 262K bytes core store, six exchangeable disc stores and four magnetic tape units.

STOP PRESS

TELEPHONE: 01-928 3333

Wills' KDF9 back at work

The flooded KDF9 computer at Wills' cigarette factory at Bristol is now in operation again. While ICL engineers have been clearing the machine of its coat of mud and damp, the result of the West Country floods four weeks ago, processing has been carried out on a BAC KDF9 at Silton.

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