MICRO-SCOPE

Newman College

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MICRO-SCOPE - 4

(MICROcomputer Software Co-Operation for Primary Education)

CONTENTS

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We hope many readers will join M.A.P.E. (see P.2) - regular mailing of 'MICRO-SCOPE' is just one of the benefits. Alternatively, Primary Schools and Teachers' Centres can still receive all three 1982 issues by sending us £1 to cover postage. Other educational institutions pay £5 p.a. West Midlands schools please note - these arrangements apply to you from now!

EDITORIAL

The new national association, Micros And Primary Education, is to be launched on 1st January. Details are given in the article following. We are delighted that further talks have confirmed the extent of interests we share. 'MICRO-SCOPE' will continue to act in concert with M.A.P.E. and will increasingly feature the new organisation's policy and plans.

Accordingly, our intention is to develop a more representatively national outlook. This is the last issue to be distributed automatically to West Midlands schools - like other schools, they will now have to join our mailing list or, better still, subscribe through M.A.P.E. Similarly, we are outgrowing our system of local production, and negotiations are in progress with a respected national publishing house.

'Whaddya mean, you can't remember?'

As to content, we look to M.A.P.E. and all our readers to help us reflect the national scene. Contributions for Issue No 5 (March 1982) should reach us by January 22. Themes we intend to develop next year include: evaluation of programs and of applications; the establishment of standards for software and a framework for distribution; implications for teacher training; and the use of simulations.

M.E.P.'s regional organisation is now established (see P.4), and we expect major benefits in coordination of activity and policy to emerge. Another development of major importance is the advent of the BBC's series for teachers, linked to its own new micro (see P.5).

We expect 1982 to be interesting!

NEWS FROM M.A.P.E.
-The New National Association

Readers who attended 'Exeter' will, no doubt, be wondering what has happend to the primary microcomputer association which the conference decided to form. Others may have heard rumours of the new organisation. Well, I am able to reveal that the association is to be officially launched on the 1st January 1982, by which time the final 'bugs' should be under control.

Conference members will remember the concern expressed that the emphasis of the association should be on computers and education rather than on expertise in computing. Although experts will undoubtedly emerge, the steering committee has attempted to reflect this view of the conference both in the name and the aim of the association. The name, Micros And Primary Education (M.A.P.E.), was chosen and it was agreed that the principal aim should be: - "To promote and develop the awareness and effective use of microelectronics as an integral part of the philosophy and practice of Primary Education."

The association will start by issuing to all members an information pack, which has been developed with the aid of M.E.P. (the government-sponsored Microelectronics Education Programme) and is being published by C.E.T.

The pack will include: -

1. Case Studies There are five case studies, by teachers, on how they have used specific programs in their classrooms. They cover upper and lower Juniors and Infants, and various aspects of the curriculum.

2. Micros across the Curriculum. A series of booklets edited by Roy Garland, correlating approaches in various areas of the primary/middle schools curriculum. Starter titles in the series are: Micros in English, Micros in Science, Micros in Mathematics, Micros in Humanities.

3. Classroom Management of the Micro for the Beginner. This is a collection of classroom experiences detailing how teachers actually manage micros within the classroom. Edited by David Ellingham, it is concerned not with program content but with organisation, time allocation, where to locate the micro, etc. This should provide many useful hints for the class teacher faced with the problem of sharing a micro within a class of 30 children.

4. A 'before-you-buy' Guide. This guide will outline the major points to be considered before a microcomputer is purchased in order to ensure that the purchaser is at least aware of the many pitfalls.

5. Micro Resources Pamphlet. This will include a list of useful addresses of organisations, sources of help, magazines, video tapes etc.

Unfortunately, some of the titles may not be ready for our deadline but members will receive copies of late publications hot from the press. The Annual Conference is already well into advanced stages of planning, organised by Roy Garland, with the assistance of committee members from the South West. Again it will be held in April, though please do not start making Roy's life a misery by requesting details yet - these will be published in January. Confidentially, if you wish to keep the 2nd, 3rd and 4th clear, it should be a most interesting weekend.

Another important feature of the association will be its magazine. We are very fortunate to have Roger Keeling, from Newman College, Birmingham, on the committee and through Roger 'MICRO-SCOPE' has agreed to act on behalf of M.A.P.E. This will be sent free to members, and currently appears three times a year. Contributions from M.A.P.E. members will certainly have an important part to play in the future development of the magazine. So let's have your ideas and articles so that we can reflect the views of the members.

We also hope to be involved with the development of software for the primary school. Quite how this will be done is still being discussed but we will be ready for January. In the meantime, any aspiring authors please contact me and I will detail the type of proposal which we are considering. This is almost certain to be linked with a commercial software organisation who,it is envisaged, will produce a catalogue of M.A.P.E. programs. Again we are looking to members to support this project - you will be the ones to benefit.

Members will also be kept in touch with developments through newsletters and their regional representatives, who will have a contact list for their area and will help members to contact others with specific interests. It is hoped that groups will be formed in each area to exchange ideas, information etc. on a local basis.

For those that require it the association is arranging insurance cover for machines and accessories at preferential terms. Details will be available later.

Finally, money. The subscription for membership to the association has been set at £7.50p. per annum, running from January to January each year. This was decided to save the secretary and treasurer suffering nervous breakdowns, we still have to work.

When establishing any new organisation there is always the initial period when unforeseen 'bugs' become apparent. I hope you will bear with us. We are anticipating an exciting first year. Why not join us? Membership forms will be printed soon. Send a S.A.E. so that I can post you yours as soon as they are available. Please bear with me if you do not receive yours by return of post, I shall try and reply as quickly as possible.

Barry Holmes (Secretary)
St Helen's C.P. School,Bluntisham,Cambs.

Microelectronics And Computers in Education (M.A.C.E.) — West Midlands Regional Centre.

As you are a reader of 'MICRO-SCOPE' then I can assume that at least you have already heard of the Microelectronics Education Programme (MEP), even if you are not quite sure how it aims to help the classroom teacher. Well, the Government has made available £9 million in the period 1980-84 to help schools to prepare children for life in a 'microtechnological' society. The strategy adopted by the MEP has been to divide the country into 14 regions, each with a Regional Centre from which the Programme's activities will be coordinated.

The Programme itself will support activities in the areas of curriculum development, teacher training, and resource organisation, and will work closely with LEA's to support schools and individual teachers.

The West Midlands Regional Centre serves teachers in the following authorities: - Birmingham, Coventry, Dudley, Hereford and Worcester, Sandwell, Shropshire, Solihull, Staffordshire, Walsall, Warwickshire, and Wolverhampton - and is based at this address:

MACE Regional Centre
Four Dwellings School
Dwellings Lane
Quinton
Birmingham B32 1RJ
Telephone: 021 421 6361

We hope to provide a comprehensive information and advice service to all teachers interested in the use of microelectronics and computers in education, and you are invited to telephone or write to Ian Glen, the Regional Director, contact our Information Officer, Christopher Pedley, or come up and see us between 9.00 and 5.00 on any schoolday.

For further information contact the MACE office or look out for our Regional magazine, to be published in December (send A4 SAE for your personal copy).

Ian Glen
Regional Director.

BBC SUPPORT FOR MICROELECTRONICS EDUCATION

This article was written for 'MICRO-SCOPE' by Hazel Sumner, the Teacher Education Officer of the School Broadcasting Council. It confirms the importance attached to the Primary field by the BBC, whose contribution is likely to be increasingly influential.

Earlier this year the School Broadcasting Council completed an investigation into the current relationship of micro-electronics to education in schools. There were three main dimensions to the enquiry -

(i) a postal survey of all LEA's;

(ii) discussions with project personnel and other leaders of curriculum development involving microelectronics;

(iii) visits to schools, including some primary schools, by the SBC's Education Officers.

A major problem was the rapid development taking place in this aspect of schools' work. The situation shifted, even as it was being investigated! Now, only four months later, the findings have an aura of 'historical evidence' about them. Nevertheless, the investigation has provided a data basis for short term policy decisions. The strength of the trend towards the incorporation of microelectronic technology into education, which the enquiry confirmed, has reinforced the intentions of educational broadcasters to make a long term commitment to the provision of support for this aspect of education.

Replies were received from 81 LEA's, giving a 65% response rate. It will come as no surprise to readers of this journal to learn that very, very few primary schools have any hardware - about 1% according to the LEA returns, though this is probably an under-estimate. In any case the situation may well be transformed in the not too distant future by the probable extension of the DOI 'micro in every school' scheme to the Primary sector.

The survey also indicated that Computer Assisted Learning (C.A.L.) was rated by LEA's generally as the most important application of computers in primary schools, though this was displaced for middle schools by computer appreciation/awareness as a curriculum priority.

The consultations and visits left the investigators with no clear picture as to the kind of support which broadcasts could provide for primary schools, except that there was an obvious need for increasing primary school teachers' level of awareness as to the potential of microelectronics to contribute to primary

education. However, as needs clarify, the provision of microelectronics-related broadcasts and series for primary pupils is sure to follow.

The current output of the BBC's educational broadcasting departments includes several series which are of interest to teachers in primary schools, though there is at present only one set of programmes for primary pupils on the microelectronics revolution. Called Today and Tomorrow, this series of four 20-minute television programmes will be broadcast again on Monday afternoons (repeats on Wednesday mornings) during the Summer Term 1982. It is designed for 11-year-olds and aims to provide a springboard for ideas about developments in technology which may significantly affect children's lives in the future. One of the programmes shows how microprocessors are likely to revolutionise our lives and it aims to appeal to pupils' imagination by projecting these developments forward into the next century.

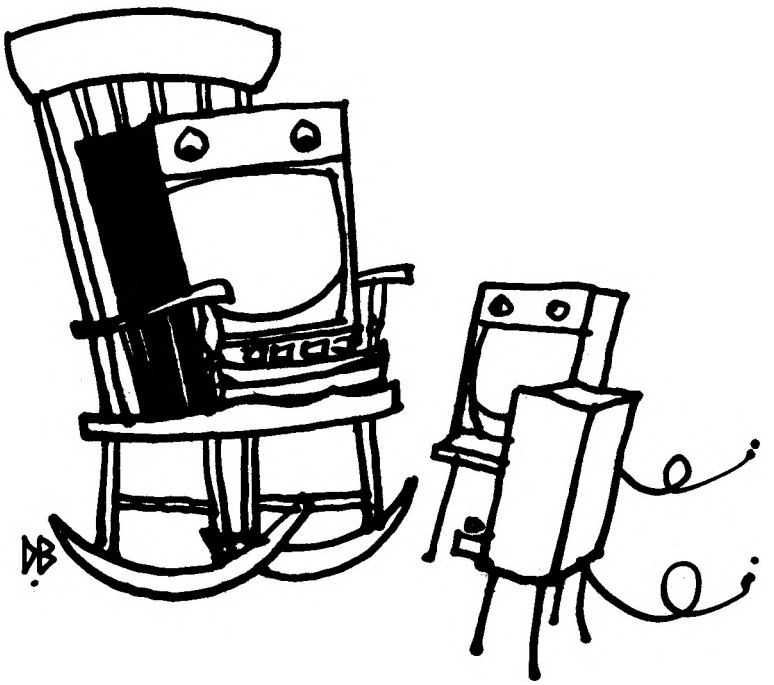
We are all learners when it comes to the understanding of revolutionary technological developments and several series for older pupils can be of use in helping teachers to understand the scientific background and the social implications of the micro revolution. Among them is "The Silicon Factor", a unit of three television programmes in the General Studies series for sixth formers. These are being broadcast again during the Autumn Term 1981 and, used in recorded form, the programmes could form an ideal focus for school-based inservice meetings.

For teachers who want to gain some insight into the scientific background to microelectronic developments there is Electronics and Microelectronics, a ten-programme radio series for 14-16 year olds. Those of us in the Primary sector who feel less than confident about science and technology will find the five radiovision programmes in this series to be particularly helpful.

Though made primarily for pupils , all these programmes can be of help to teachers also. However, the 1981-82 schedules contain two series made specifically for teachers. These are -

(i) Micros in the Classroom - two programmes showing how microcomputers are being used at the moment in a selection of schools in various parts of the country. Programme 1 focuses on secondary schools, but programme 2 is about micros in primary schools. The programmes are being supported by a training package which is being developed by MEP. This is being distributed to all LEA's. Further information and copies for inspection are available at each of the MEP's Regional Centres.

(ii) Learning About the Chip - This series of six radio programmes will be broadcast on Monday evenings during the second half of the Autumn term. The aim is to examine key issues facing educationists in recognising and meeting the demands implied by the new technology. The series is likely to be invaluable as background to the making of



'Mummy, can you really remember when there were valves?'

curriculum policy decisions. Recorded use, in group meetings, is strongly recommended.

The other major broadcast contribution during 1981-82 is what has come to be called The BBC Computer Literacy Project. Starting in January 1982, this project centres around ten television programmes and a specially developed microcomputer which are likely to be of seminal importance in their impact on the general public's insight into what a microcomputer can do. For further details readers are referred to a previous article in 'MICRO-SCOPE 3' (June 1981), 'Microcomputers and the BBC'.

So much for the present - but what of future broadcasts in this area? Several possibilities are worthy of note. Two of these will be considered by the Schools Broadcasting Council when it meets during November. (The School Broadcasting Council is the body which decides educational broadcasting policy for the BBC.) One proposal is that there should be a short radio and radiovision series for 14-16 year olds. As it stands at present, the first programme would give an over-view of the impact of computers on everyday life. This programme would provide background for the teachers. The remaining four programmes would be for pupils. They would be radiovision programmes illustrating how computers affect selected aspects of daily life.

The second proposal is for a television series for 13-16 year olds. This would provide broadly based resource material on the uses and wider implications of computerisation.

For teachers themselves, a follow-up to the television series Micros in the Classroom is being considered. This might run to another three programmes on micros in education. In addition, for general audiences - teachers included - there is the possibility of a further ten-part television series, designed as a sequel to the first series of broadcasts in the BBC Computer Literacy Project.

It must be emphasised that these are possibilities, not hard plans, though of one thing readers can be certain - there will be broadcasts to support teachers as they seek to ease their pupils' entry into a world made different by the advent of the micro. Some of these broadcasts will appear as identifiable series. Others will appear incidentally in established series. In the long run these incidental references to the uses of microtechnology may well be the more significant for they will reinforce for pupils the fact that the micro revolution has become an integral part of our culture.

In conclusion, mention must be made of the exciting possibilities inherent in the Telesoftware and Education Project currently in progress at Brighton Polytechnic. This enables BBC's CEEFAX and ITV's ORACLE to transmit programs to schools. Special television sets which are capable of capturing this telesoftware have been developed by Mullard . The Project is in the early stages at present, but it opens up the possibility of a whole new dimension to educational broadcasting as we know it now.

Hazel Sumner

* * * * * *

Telesoftware - Program Exchange Made Easy!

- We know only too well that the dissemination of programs by cassette, disc or listings is time-consuming, and not always reliable. The future lies with new technology which can capture software directly off-air or by telephone. Brighton Polytechnic's Telesoftware and Education Project (referred to above by Hazel Sumner) is exciting and important.
- We recently met Leslie Mapp, the Project's Research Fellow, for an exchange of ideas and information, and will keep readers informed of developments. Here are some extracts from the project's first newsletter (Summer 1981):-

"The BBC and ITV TELETEXT services will transmit pages of programs and the project staff will work with the nine participating schools to study their use and help develop suitable materials.

"A telesoftware set consists of a 22" colour teletext television with a full keyboard attached. While not exactly portable, it is nevertheless easily moved once trolley-mounted, and the equipment design reflects its multiple roles. In a classroom as a colour television; in a library as a teletext information resource; in a lecture room as a visual demonstration screen or in a laboratory or classroom as a micro-computer, a telesoftware receiver could satisfy tasks presently requiring many separate pieces of equipment. For education, telesoftware therefore

offers a number of benefits. The integrated nature of telesoftware sets provides sophisticated equipment capable of many uses; its flexibility enables several teaching areas to use a single unit.

"By making telesfotware simple to use, expert computing knowledge will be less necessary and microcomputers can move more easily out of their present maths/science bias. One of the express aims of the research project is to investigate software for non-specialist use which, in practice, means arts and humanities teachers.

"Test programs are currently being broadcast on pages 700-702 (CEEFAX, BBC 1) and 175 and 184 on ORACLE (ITV). These are available visually on any teletext receiver but, of course, cannot be captured except on telesfotware equipment. Broadcast software will include programs representing the range of those currently available. The project team is also developing special software sub-routines to capture information broadcast as part of normal teletext pages (e.g. FT index, weather statistics), to provide continuously revised data for use in other programs.

"The TELESOFTWARE AND EDUCATION PROJECT will provide insights into the educational potential of telesoftware, testing the feasibility of providing cheaply distributed and centrally produced educational software over a wide spectrum of subjects. It is an ambitious venture in that the equipment and techniques being placed in the hands of schools are very much state-of-the-art, yet the project's management has ensured that it will be the educational needs which will lead the technology not vice-versa."

● Other developments in this field are noted in C.E.T. Information Sheet No.3 (address on P. 40)

CET has just set up a two-year trial scheme for the distribution and reception of computer programs via telephone lines, using PRESTEL. Up to 25 institutions will be supported with a library growing to a limit of about 50 well tried and tested programs. Other institutions can use the service at their own expense: contact the Telesoftware Project Manager, Burleigh Teachers Centre, Wellfield Road, Hatfield AL10 OBZ. Currently, access is available for an RML 380Z with a modem and Prestel jack socket from British Telecom.

The BBC will initiate experiments in telesoftware, based on its own new Microcomputer and using CEEFAX and ORACLE. A low-cost teletext decoder with a Prestel facility will be an optional peripheral. Alternatively, program listings can be copied by hand from teletext sets!

Running costs via Prestel compare favourably with postal charges for discs. The Teletext distribution service is free. "It is not yet clear how program providers will charge for their programs, where a normal selling price is involved."

John Lane.

TWO EVALUATION PROJECTS

It is time, now that the first wave of enthusiasm has settled, to take a long hard look at the prospects for computers in primary schools. We are all working in the dark. Progress is diffuse, practice is haphazard, successes and failures too often go unrecorded. 'MICRO-SCOPE' intends to provide a forum for informed debate based on an exchange of experiences and opinions.

In particular, we wish to report on any organised efforts to summarise and appraise current practice, or to fill the software gap. In this issue we have initial outlines of two projects just getting under way: future issues will follow their progress. Our pages are open to other initiatives in this field from around the country.

We also invite discussion of the issues raised, and additional reactions from readers' own experiences and observations. Co-operation in this crucial area is a key to sound progress.

The Birmingham Project 1981/82

Introduction

MICRO-SCOPE 2, April 1981, has already reported on the Microelectronics And Computers in Education (M.A.C.E.) project, which was run for the West Midlands during the year 1980/81. It gave us the opportunity to 'dabble' with microcomputers in Primary Schools. We put two Tandy TRS 80 machines into two classrooms for the year in order to see what would happen when the children in the classrooms had got over the initial excitement and had accepted the micros as just another piece of equipment.

We learned a lot during the year, but the biggest lesson was that the software available was sadly lacking in both professionalism and educational content. Many games were available, and proved to be popular(what a surprise!), but when it came to educational software there was very little from which to choose.

It also became apparent that few people had given much thought to the management of the micro in the school. It is easy to say what should happen,from outside the school, but it is another matter when you are a teacher within the school being asked to 'evaluate' the machine.

We decided that if we were to progress from this start, we would need a group of teachers who had some experience of using micros, and who could specify what software they wanted so that programmers could write to these specifications. It was not good enough to leave the programmer to work alone as the software produced often lacked educational viability. Thus we have developed the idea into the Birmingham Project for 1981/82!

The Aim

We hope to produce a group of Primary schools who have had experience in operating microcomputers and who can become the mainstay of software generation for Birmingham Primary Schools. We hope to keep in very close contact with these schools during the coming year, as well as providing the opportunity for them to meet each other and discuss their progress. We will provide the programming expertise so that ideas generated within these schools can be programmed and evaluated in a reasonable time. Software developed in this way will then be available to other Birmingham schools.

The Equipment

Birmingham has standardised on the Research Machines 380Z for use in secondary schools, and it was thought desirable that the machine used for the Primary Project should be compatable. Therefore it was decided that we should use the Research Machines 480Z for the Primary Project. This, of course, is a completely new machine, but it provides us with a clean start . We do not have to 'evaluate' a lot of software which is already available, because there isn't any! We can develop our own ideas right from the start.

The Schools

During the year 1980/81, we ran a Primary Computing Group every Monday evening. In that time the total number of schools who became involved must have been close to 30, with a 'hard core' of about a dozen. It was agreed that this group of twelve should be the start of the Project. When we had sorted out the finances for the year, we had five schools who were sufficiently interested to put some of their hard-won money into microcomputers, and with some help from the Birmingham Educational Computing Centre, orders were sent off for the machines. Before they arrive, we hope to be able to visit all the schools individually and offer an in-school session so that all the members of staff can see a computer, and a human from the Computer Centre, as well as discuss their thoughts and apprehensions about the Project. At least one member of staff in each school will have been to the Computer Centre on the Monday night sessions, but we would like the whole staff to feel involved in the Project. We have started work on a program specification system for teachers, and we hope that during the coming year we will be able to make use of this system and generate software for the 480Z which will overcome the inadequacies found in current software.

Colin Watkins

Newman College Schools Project 1981/82

As announced in our last issue, this project is designed to monitor and evaluate the use of micros in six local schools. Financial support for the hardware, from Research Machines Ltd and the DOI, has already been acknowledged gratefully. Now we can thank MEP for providing funds for a 4-term Teacher Fellowship in support of the project.

A final report is expected in Summer 1983. Meanwhile, 'MICRO-SCOPE' will provide some commentary on developments. The following objectives have been defined:-

a) to monitor and record the applications;

b) to comment on the effectiveness of existing software;

c) to provide new developments in software (in so far as this is directly relevant to the needs of the Project);

d) to seek to identify promising areas for positive development, with relation to subject content, classroom organisation or teachers' needs;

e) to note inappropriate uses and areas of difficulty;

f) to propose outlines for further research.

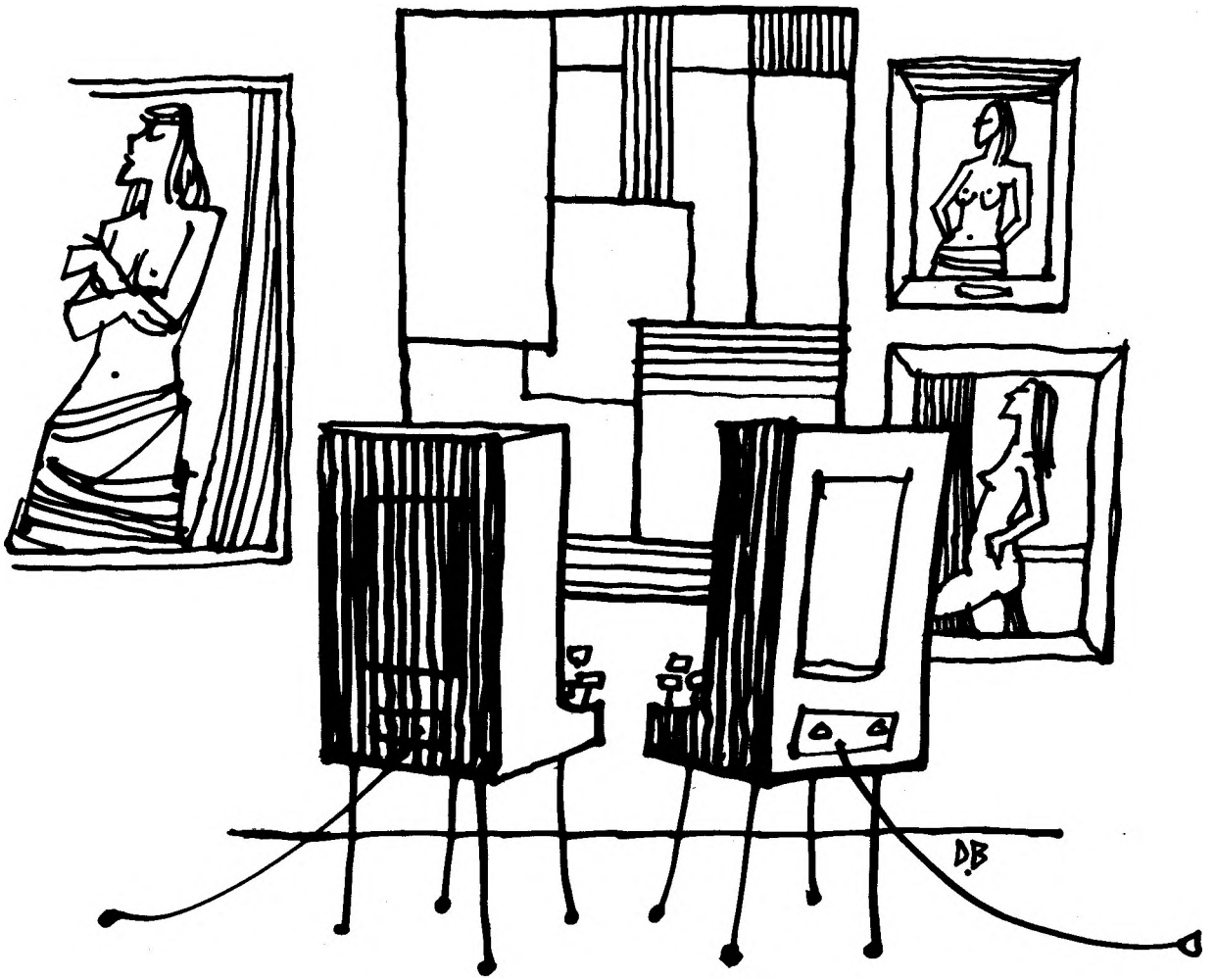
A great deal of valuable spade-work has been done in the participating schools already, before the computers arrive in November! In the following article, one of the teachers records the process of preparation.

Getting Ready for the Micro

On learning of the possible acquisition of a micro my first aim was to justify its use in school, not only from theoretical educational aspects, but from the most important aspects of all. Would it work in my school? And would my colleagues be prepared to use it and thus stop it from becoming one of the fabled "nine-day wonders/dust collectors"?

At some unspecified day in the future there would appear on the school doorstep a box marked " dn ʃǝɯ sɪɥʇ", containing the "mighty micro". Great - then what do you do? Is there someone available who can program the beast? I satisfied myself that by hook, or by crook, programs would be available and would be capable of being developed to further stages. Then I started the process of convincing my colleagues that - Yes ! - there was a place for a micro in our School.

This consisted of finding any micros that were available and having them in classrooms as much as possible. The micros that were available were a PET and a RML 380Z, the first loaned by



'I don't know much about Art, but I know what I like.'

Sandwell and the 380Z by Newman College. The PET created its own problems and the first practical test ..... there were no programs! So one weekend and one bottle of Optrex later and no small thanks to Newman's Basic Programming Course I emerged with a suite - be it ever so small - of working programs. The PET was then tried around school in a variety of age and ability ranges. The remarks that came back from the colleagues concerned sounded quite favourable. The next major task was yet to come - how to get the micro classroom-tested by someone who initially was very wary of "That machine or any other machine for that matter!" This was overcome by a Fifth Column; I think the quote was "Dave, can I borrow that machine of yours because little Johnny in my class has just complained to me that his friend in the next class has had the computer in his room for two half mornings and we haven't had it at all!" Little Johnny has no idea how much I am in his debt!

The PET proved to be quite a handy little machine and is still being very useful in the interim period between the decision to have a micro and the actual delivery date. It is helping me to develop a Flying Squad of third and fourth years who are capable of loading programs wherever the micro is situated, thus freeing the class teacher of the labours of loading each time the machine is moved to a new location or needs a new program.

The 380Z was loaned to us by Newman with a suite of programs already on disc! Yes, you guessed it! My Flying Squad had just been grounded - they were used to cassettes. As the machine we were hoping to buy was cassette-based and the 380Z was on limited loan, the Flying Squad was reduced to one. The programs developed for the 380Z by Newman proved to be very successful with the classes that had the opportunity to use them in the time available. Towards the end of the loan and as interest amongst my colleagues was increasing, Roger Keeling visited the school to give a talk on "the Role of a Micro in Primary School". Another notable quote from the staff before he arrived - "He will speak in English - I hope! Not all this peripheral this and that!" Forewarned, Roger pitched his talk at the appropriate level and increased our interest still further.

At this stage it became clear to us that we would soon want to have our own micro. After consultation with Sandwell's adviser, Nigel Power, we were invited to become one of the six schools in Newman's evaluation project.

We wanted the micro to fit us rather than us fit around it. As we have nineteen classes containing approximately 600 children the first decision was whether it was to be a plaything for all or an educational tool for some. We decided to specialise in two areas, rather than try to cover the whole curriculum with a variety of topics and areas with no real continuity. Having had the experience and problems of moving micros around school, we decided to locate the micro in a room and move the necessary groups of children to it. We chose Compensatory Language as one of our two specialist curriculum areas, based on individual or small-group learning. In order to gain a different experience we selected a Geography-biased area from our Social Studies scheme to develop larger group work.

Our planning starts with a group of staff with expertise in each of these curriculum fields who meet and decide the educational needs of the programs to be developed, rather than a group of programmers writing a program and then looking around to find children that will fit it. Our programmers will come on the scene after the style of the program needed has been decided. If we think it can be programmed then we progress from there - if not, back to square one. Notice I say programmers - the interest is growing steadily from one teacher on a Basic Programming Course last year to five this year at various Colleges around the West Midlands and one on Advanced Basic at Newman.

The only thing we are all waiting for now is a little box labelled "THIS WAY UP!".

David Breedon, Head of Maths,
Parkside Junior School, Sandwell.

The New RML Link 480Z

Software tends to fall into 3 broad categories:-

(a) designed and often programmed by educationalists;

(b) designed and written by manufacturers to add supposed appeal and validity to their hardware;

(c) imported from the States with the need for some degree of rewriting to eliminate the American bias.

The software available for the RML 380Z tends to fall into category (a) and much of it is suitable, perhaps with minor adaptations, for use in the primary sector. The 380Z is one of the most popular micros in the secondary sector and one of the two machines named by the Department of Industry in their subsidy scheme for secondary schools. Yet despite this recommendation and the reliability and robustness of the RML equipment, it is generally regarded as too expensive for the primary sector. Is all the existing software therefore wasted as far as primary teachers are concerned?

The simple answer is 'No'. For now comes the RML Link 480Z (originally named the 'ministation'). This is a 32K cassette system that is "upwards compatible" - in other words it will run all 380Z software. Available now, it retails at £550. You also need a cassette recorder and a video monitor or B/W TV set. Both the primary projects reported above are based on the 480Z. The ILEA primary project has succeeded in finding funds to base its work on the 380Z. A serious contender in the primary sector will be the long-awaited Acorn/BBC micro. However, we have yet to see this machine or a sample of the software available for it. We have still to be convinced of the capability of the company to meet the prospective demand. We hope it will be available for review in the next issue, and will fulfil our expectations.

The 480Z has many attractive technical features. The 32K memory can be expanded to 64K (58K user), with later plans to add a further 192K of RAM as back-up data store. It offers both 40- and 80-character line lengths, upper-and lower-case characters, windowing and scrolling. The keyboard includes 4 cursor control keys and four special function keys, all of which are user-definable. The display also has a 128 character set,plus 80 x 72 or 160 x 72 low resolution graphics in two shades of grey. There is also a miniature internal loudspeaker driven by digital to analogue converter. Output facilities include video and UHF, parallel I/O (suitable for driving centronics standard parallel printers) and three serial interfaces. There is also paddle and pushbutton input and analogue output.

An attractive extra (at about £200) is the Expansion Board offering high resolution graphics. The graphics memory is separate from CPU RAM, so the full address range of the CPU may be used. These are the most relevant advances together with a 16K Basic in ROM now under development.

The 480Z is therefore a serious contender for the primary market and includes many facilities that are often found as extras on other makes. With the advent of the Acorn/BBC micro on the doorstep, primary schools are suddenly faced with a choice between two well supported British machines. We will keep you informed as to how these firms meet the challenge.

R. Keeling

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"Please Sir, I Can't See!"

● The following notes arise from an interesting discussion with teachers on the size of video monitor to be ordered for Newman's Schools Project.

Most primary schools do not have the space to put a room aside exclusively as a computer resource area, and therefore the equipment has to be taken into different classrooms. Portability is a key concern.

On the other hand a small monitor precludes the use of the micro as a teaching aid with a whole class.

One solution is to use a large (20"+) black and white TV set (preferably on a trolley to raise it to a height of about 5 feet). If the micro has a UHF output, a single lead will connect it to the aerial socket of the TV. For this purpose a colour TV is very much inferior since it is lacking in both clarity and resolution. Given then that a large TV screen is available to use with the micro in a class situation, the school could consider buying a smaller video monitor for individual/group situations (perhaps 12"-14").

We have managed class teaching with a 17" Hitachi monitor and also a 19" Sanyo (incidentally, shop around as prices differ widely), but these are heavy and not easily portable. The 19" Sanyo cost us £132 and weighs 24kg. We looked for a compromise. At present we have settled on a 16" Sanyo (£114 and 12.2kg) but any other 16"/17" monitor of a modest weight should be suitable. We would of course, be delighted to hear how other schools have overcome the portability/class viewing predicament. Letters to the Editor please.

R. Keeling.

WINNING TEACHERS OVER

In 'MICRO-SCOPE 1'(Jan 1981) I wrote about my experiences with a borrowed 380Z. In March this year our school purchased a Tandy TRS-80 Model 1 microcomputer. Half of the cost was borne by Walsall L.E.A. in line with their plan to standardise on the TRS-80.

Our headteacher is very enthusiastic about the new technology and has given his full support to its development within the school. The initial reaction of the great majority of the staff was, however, one of suspicion and scepticism. The feeling was that the money could have been much better spent. It was my belief that this antipathy would disappear once the staff had experience of using the micro and realised its potential. A major snag became apparent almost immediately - lack of software. The L.E.A. had supplied two programs with the micro; a mathematics test and a maze game; hardly sufficient to justify the expense in terms of educational usefulness! I set to work to produce a wider range of programs and by the end of the summer term we had about a dozen programs covering basic number work and language skills.

With such a limited range of software available, the staff were still having to plan their work to fit in with the available software rather than being able to use the micro to supplement and enhance work in progress. They felt, quite justifiably, that they should be able to say, "This is what I am going to do, and I would like a suite of programs to supplement the work."

Obviously we could not meet this demand ourselves. I got in touch with Dave Futcher who runs the National TRS-80 Educational Users' Group. I sent him a tape of the programs I had written and was delighted to receive, by return of post, a cassette containing 30 educational programs free of charge. The software was of the highest quality, written and tested by teachers and covering all basic subject areas.

A couple of days after receipt of this package, a member of staff approached me to ask for a program to help with visual memory related to spelling. I was able to use one of the programs we had received and she was pleased with the results. That was the beginning of a quiet revolution in staff attitudes towards the micro. Most of the staff have now attended programming courses run by the L.E.A. and are becoming more and more confident in handling the computer. They suggest new programs and modifications or improvements to existing software. The computer is fully timetabled each week and has come to be regarded as an asset rather than a very expensive liability. Our software library now contains over 90 programs and is growing weekly. We have purchased no commercial software. Everything is either home-produced or from the Users' Group Software Library.

I feel that there is a very important lesson here. It is that a school with a computer needs someone who can provide software to meet the specific needs of the staff. The curriculum of the school must shape the software and not vice versa.

Finally, a thought for those with the power to influence L.E.A. policy. A microcomputer needs programs and programming is a very time-consuming business. Either provision should be made for exta staffing for in-school programming, or support on the lines of the Walsall E.D.C. Microcomputer team must be provided. Otherwise there is a risk that microcomputers in primary schools will end up gathering dust alongside the teaching machines of ten years ago, and a great opportunity will have been lost.

Steve Moss, Deputy Head.
Hundred Acre Wood First School
Valentine Close, Streetly, Sutton Coldfield.

*** Any TRS-80 users in the West Midlands area who are interested in joining the Educational Users' Group should contact me at the above address. (Tel. 021-353 4792)***

A Computer Aptitude Test (for pupils)

This is a short test to see whether or not you may be suited to working with computers. You have three minutes to complete the test. Please read the questions through before you start writing.

Begin when your teacher tells you.

1. Put a cross in this box: ☐
2. Write your Christian name backwards. _____
3. What is 12 + 7 ? _____
4. How many days are there in 2 weeks? _____
5. Stand up and sit down again.
6. ¿uoıʇsǝnb sıɥʇ pǝɐɹ noʎ uǝɔ YES/NO
7. How many zeros in one million? _____
8. Recite out aloud 'Humpty Dumpty'.
9. Write your teacher's name here: _____
10. Wave to your teacher.
11. How long is a piece of string? _____
12. Take your shoes off and put them on your hands.
13. Now, with your pencil in your mouth, write down the numbers 1 to 10: _____

Now that you have read all the questions, as you were asked to do at the beginning, do not answer them. Just sit quietly and fold your arms till the time is up. You have finished!

R.K.

OUR SECONDARY NEIGHBOURS

As more teachers in primary schools become interested in microcomputers, the pressure on courses increases. One under-used resource is the nearby Secondary School. This account shows an interesting initiative across the Great Divide.

During recent visits from our Primary intake schools, the staff and pupils spent the last quarter of the day looking at our Tandy TRS-80 computers. The children showed considerable enthusiasm and knowledge, but most of the staff admitted they knew little about computing and were not aware of the computer's potential for them.

With this in mind, we decided to put on a short course at the end of the Summer Term on "Computer Assisted Learning", with special emphasis on "Uses across the Curriculum". The response was quite good, and twenty-two people from primary schools, including seven headteachers, visited our school for the afternoon.

The idea of the course was to show examples of software suitable for primary schools in as many subject areas as possible. We selected thirty-five educational programs, which covered English, Mathematics, Geography, History, French, Science, Music and Art. All the software had been written by my wife, who is a computer professional. With this in mind, she was also invited to attend, so that expert advice would be on hand. She was also interested in listening to people's opinions of her work.

We set up five 16K level II TRS-80's in a laboratory. I gave a short introduction, showing the difference between identical programs, one with no documentation and one with instructions, in order that the importance of documentation in a program could be made. The group was given about one and a half hours to browse from machine to machine to see as many programs as possible, and then invited to write down any comments or criticisms, and also any ideas for programs which they might consider suitable for the primary school.

The initial difficulty of ensuring five programs were always loaded, on a cassette based system, was soon overcome and an interesting and helpful afternoon followed. Some people were loath to leave the machines once they had the idea. We had computing material available in the form of "Micro-scope", "Educational Computing" and an excellent paper entitled "Computer Assisted Teaching", by Philip Crookall, a Cheshire County Adviser.

There seems to be no reason, providing suitable software is available, why other schools in the secondary age range should not provide a similar service for their primary neighbours. Perhaps I should mention some of the pitfalls which one should try to avoid.

Firstly, one should not attempt too much in one session, especially as some of the group knew nothing about computing and even less about its classroom possibilities. In fact one or two expressed doubt as to its use at all, which seems a little shortsighted. It is therefore suggested that any one attending such a course should have some background knowledge.

Secondly, even though I always had three other members of staff available, we found it difficult to keep programs loaded. Staff also need to be well briefed on the programs being shown in order to answer questions. This obviously takes time, which may not be available.

Thirdly, we felt that the use of pupils in the demonstrations would have been helpful. Some of the teachers felt, despite the fact that most of the programs had been tested in schools, that some were a bit trivial, because they were not prepared to think at the children's level.

Finally, people were prepared to make criticisms, but not to write them down, neither were they prepared to follow instructions given in program documentation!

One thing was blatantly obvious. Teachers in Primary Schools keenly want to know about computing. Supply does not appear to be meeting demand, despite many courses being run by our local authority, which are quickly filled up.

Peter N. Dowdle (Mathematics Department)
The Heath Comprehensive School,
Clifton Road, Runcorn, Cheshire.

The Micro Does the Admin!

As a head, I now teach half-time, with the result that a few visits from anxious parents soon puts an enormous strain on the admin. The problems I have to face have led me to develop programmes for primary school administration. With cuts in secretarial hours, efficiency is essential. This letter is stored on disc till this afternoon, when the day's outgoing mail is typed by our electronic typewriter. Our school meals administration is dealt with in a matter of seconds. We produce up-to-date lists of children in any chosen order and matrices of the form 7 kind, showing age and catchment area distribution throughout the school. Our school accounts have an electronic audit each day, so that errors are pointed out more or less as we make them.

No doubt, I have lost much time (my own time!) in programming activities but we are catching up fast. The big pay off is the reduction of worry. I believe computers have much to offer in the field of personal relations. Our PET system gives me more time for people. The equipment is paid for by commercial work carried out on my own premises (the computer trolley goes home each night) and by hire fees. The money-raising part of the computer activities is registered as "Nutfield Computers Educational."

Peter Matts
Nutfield Church First and Middle School
Redhill, Surrey.

A PRIMARY B.A.S.I.C. - Part 4

In this series of articles we give examples of ideas that can be programmed and some elementary tips on how to do it. Software will only be educationally sound if teachers contribute to its planning. We are avoiding sophisticated techniques since we believe that most readers are, in fact, beginners. This article deals with Program Control, an important feature of Computer Based Learning (C.B.L.).

Choices within a program may be controlled internally by the program instructions and externally by the pupil or teacher during a program run. The separate parts of a program which cater for the different possibilities may be represented as SUBROUTINES. For example, a school may have its school list which may need sorting in various ways (e.g. alphabetically, by age/sex or form). A program could contain routines for these and also for (i) reading in the information and (ii) printing out the sorted lists. It is necessary to control such a program and to be able to jump from one part of it to another as desired. Some kind of initial option list is necessary so that the teacher/operator can choose the right route for his current purpose. Such a MENU of OPTIONS is illustrated in the article on CLOZE.

Many programs on multiplication tables are already available. Our purpose in producing yet another one here is just to illustrate some principles of control. Look at the FLOW CHART (Fig.1).

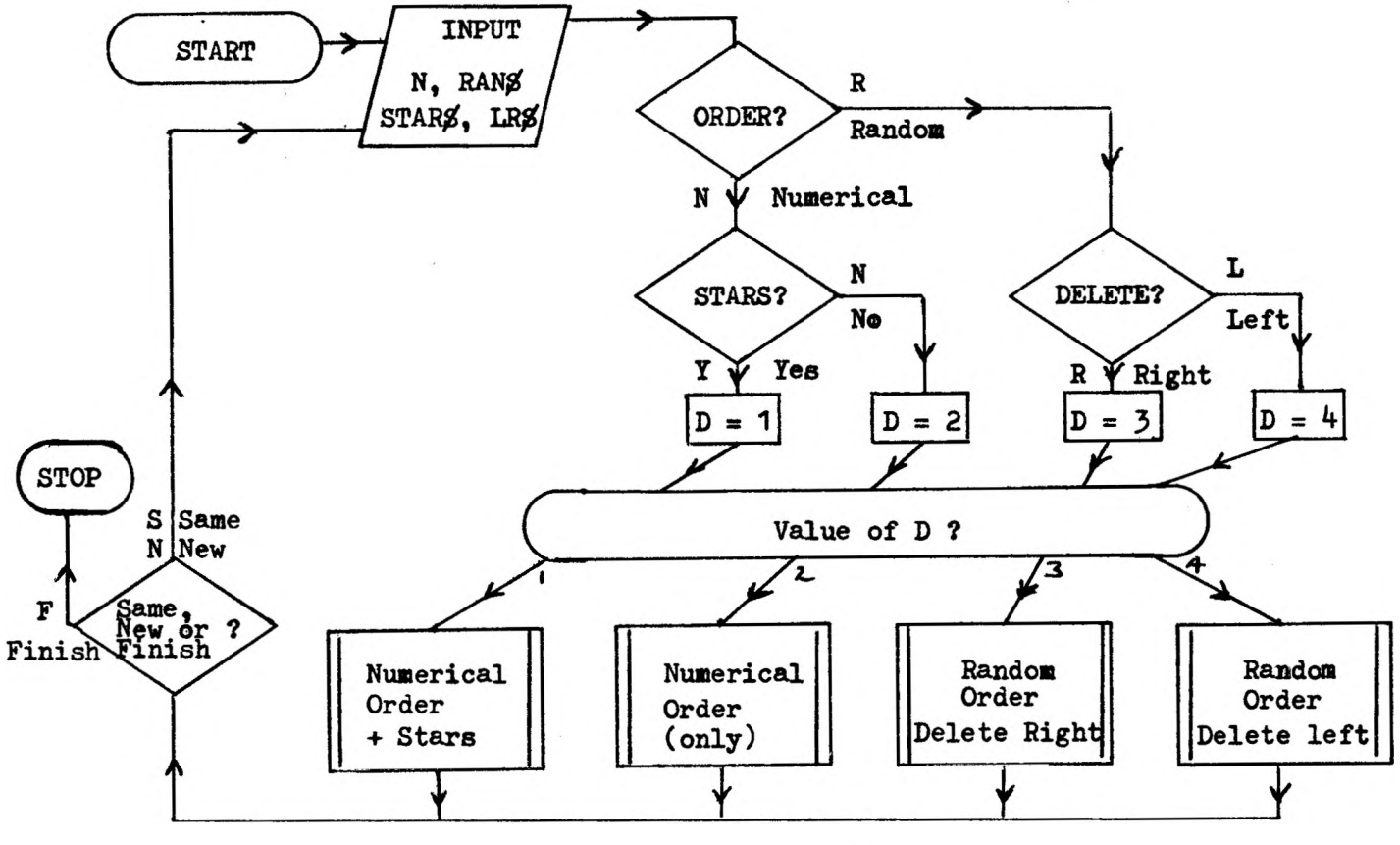


Fig. 1

First we select a multiplication table by choosing a value for N. Then there are four possible routes, each with its own subroutine. The first option asks for the answers to the products 1xN,2xN,... to be typed in. Alongside, it displays the appropriate number of rows of N stars. In the second option the task is the same, but the stars are omitted. The third presents the lines of the table in random order, as a test. Fourthly, in a similar test, factors are to be filled in rather than products.

The computer's questions and the teacher/pupil responses are shown in Fig. 2 with the responses underlined. This is the external control. The four values of D are determined by the logic box,

```
Numerical or Random Order (N/R)? N
Shall we include stars (Y/N)? N
-----------------------------------
Numerical or Random Order (N/R)? R
Delete on Left or Right (L/R)? R
```

fig.2

```
Which table? 7

Numerical or Random Order (N/R)? N
Shall we include stars (Y/N)? Y

Count the stars

******* 1 x 7 = ? 7
******* 2 x 7 = ? 14
******* 3 x 7 = ? 18
No, 18 is incorrect
The correct answer is 21
******* 4 x 7 = ? 28
******* 5 x 7 = ? 30
No, 30 is incorrect
The correct answer is 35
```

```
Same / New table, or Finish (S/N/F)? N

Which table? 3

Numerical or Random Order (N/R)? R
Delete on Left or Right (L/R)? L

? x 3 = 3 ? 1
? x 3 = 21 ? 6
No, 6 is incorrect
The correct answer is 7
? x 3 = 24 ? 8
? x 3 = 18 ? 6
? x 3 = 24 ? 8

Same / New table, or Finish (S/N/F)? N
```

fig.3

and these values control internally which subroutine is 'called' i.e. how the table appears on the screen. We can see the effect of the external control decisions in the print-outs in Fig.3. For this article we have underlined the INPUT from the keyboard. Some programming techniques dealt with in the first three issues of MICRO-SCOPE are here revised and seen in use. The loops are specially indented here to make the reading easier. We also introduce two new ideas. The first is the LOGIC BOX. We have used the relational operators before. In MICRO-SCOPE 1 we used:

```
260 IF N < 3  THEN  240
```

and

```
380 IF C = 1  THEN  400
```

=, <, > are logical operators. We may have two conditions to consider simultaneously. In this case we may have either "both-AND" or "either-OR". These are logical connectives and you may well recognise them as the INTERSECTION (AND) and the UNION (OR)

of the two SETS. In the program which follows we use the connective AND to indicate that both "numerical order" and "print stars" are chosen (in line 300 of fig. 4). In BASIC a subroutine is 'called' by a GOSUB statement (e.g. GOSUB 1200) and the subroutine ends with a RETURN statement. Such a program would look like:-

```
1000  GOSUB  1200
   ->  **********
       **********
1200 REM ** Subroutine
       **********
       **********
1300 RETURN
```

with the subroutine in lines 1200-1300. The GOSUB acts in the same manner as a GOTO statement except that its position is noted and the RETURN statement will take us back to the statement immediately following the GOSUB. In the program the GOSUB is contained within an ON - GOSUB statement which we illustrated in MICRO-SCOPE 3. Look at line 340. D can take any one of the values 1,2,3 or 4: the GOSUB jumps to lines 430,590,700 or 820 respectively, with the RETURN statements at lines 550,660,780 and 900. The starred REMARK lines help to identify the four sub-routines.

Let us now examine the program in detail. Line 140 starts the random number generator. The pupil input at line 160 is required, by lines 170-190, to lie between 1 and 12. (See how easily this range could be amended by changing lines 170/180).

Next follows the first OPTION question at line 210. The program branches here to select one further OPTION question - the response "R" leads to line 230, while "N" leads to line 250. Lines 300-330 form the LOGIC BOX in which the previous two answers are considered. Since there were two possible answers to each of two questions there will logically be four possibilities. Each combination considered assigns a particular value (taken from a counting sequence) to a variable D. Line 340 selects the appropriate subroutine according to the value of D. Now look at the first subroutine (430-540). The inner loop (460-480) prints N stars all on one line (N is the multiplicand). Line 490 prints the question M x N = , with the "?" printed on the same line by line 500, waiting for the pupil response, "P". In the loop, M takes the values 1 to 10 successively and is the multiplier. If the response P is the correct product M x N, the next value of M is chosen at line 540. If not, the error routine (520-530) gives the answer. The second subroutine is identical, except the stars are missing.

In the third subroutine R (not M) is the multiplier as in line 710. This is a random number in the range 1 to 10, as illustrated in 'MICRO-SCOPE 3'. Ten values of this random multiplier are chosen by the loop at 700-770. The fourth subroutine only differs from the third in line 840, where the

"multiplier" is missing, and lines 860/880, where the answer is considered.

Each of these subroutines returns to line 350 (i.e. the line following the GOSUB routine in line 340). Control now passes back to the user, to repeat the same subroutine, choose a different subroutine, change the table or finish (360-390).

There are many ways you could invent of improving this program. An initial demonstration could be incorporated or the level of difficulty for a second run could be altered, depending on the correctness of the initial answer . Possibly number patterns could be explored and, of course, we have not considered ways of making the program foolproof. What we have examined are ways of jumping about internally within a program and externally modifying the output by prescribing conditions. There is ample scope here for your own inventiveness.

J. Fair.

'Next!'

```
LIST

100 REM
110 REM ***************** TABLES ****************
120 REM ************** Set Option **************
130 REM
140 RANDOMIZE
150 PRINT
160 INPUT "Which table";N
170 IF N>0 AND N<13 THEN 200
180 PRINT"Between 1 and 12 please"
190 GOTO 160
200 PRINT
210 INPUT "Numerical or Random Order (N/R)";RAN$
220 IF RAN$="N" THEN 250
230 INPUT "Delete on Left or Right (L/R)";LR$
240 GOTO 260
250 INPUT "Shall we include stars (Y/N)";STAR$
260 PRINT
270 REM
280 REM **** Jump to appropriate subroutine ****
290 REM
300 IF RAN$="N" AND STAR$="Y" THEN D=1
310 IF RAN$="N" AND STAR$="N" THEN D=2
320 IF RAN$="R" AND LR$="R" THEN D=3
330 IF RAN$="R" AND LR$="L" THEN D=4
340 ON D GOSUB 430,590,700,820
350 PRINT
360 PRINT "Same / New table, or ";
370 INPUT "Finish (S/N/F)";M$
380 IF M$="S" THEN 200
390 IF M$="N" THEN 150 ELSE 910
400 REM
410 REM ********* D=1 (Stars,numerical) ********
420 REM
430 PRINT "Count the stars"
440 PRINT
450 FOR M=1 TO 10
460   FOR L=1 TO N
470     PRINT "*";
480   NEXT L
490   PRINT M;"x";N;"= ";
500   INPUT P
510   IF P=N*M THEN 540
520   PRINT "No,";P;"is incorrect"
530   PRINT "The correct answer is";N*M
540 NEXT M
550 RETURN
560 REM
570 REM ******* D=2 (No stars,numerical) *******
580 REM
590 FOR M=1 TO 10
600   PRINT M;"x";N;"= ";
610   INPUT P
620   IF P=N*M THEN 650
630   PRINT "No,";P;"is incorrect"
640   PRINT "The correct answer is";N*M
650 NEXT M
660 RETURN
670 REM
680 REM ** D=3 (Random order,right deletions) **
690 REM
700 FOR M=1 TO 10
710   R=INT(RND(1)*10+1)
720   PRINT R;"x";N;"= ";
730   INPUT P
740   IF P=N*R THEN 770
750   PRINT "No,";P;"is incorrect"
760   PRINT "The correct answer is";N*R
770 NEXT M
780 RETURN
790 REM
800 REM ** D=4 (Random order, left deletions) **
810 REM
820 FOR M=1 TO 10
830   R=INT(RND(1)*10+1)
840   PRINT "? x";N;"=";R*N;
850   INPUT P
860   IF P=R THEN 890
870   PRINT"No,";P;"is incorrect"
880   PRINT "The correct answer is";R
890 NEXT M
900 RETURN
910 END
```

```
RUN

Which table? 2

Numerical or Random Order (N/R)? N
Shall we include stars (Y/N)? Y

Count the stars

** 1 x 2 = ? 2
** 2 x 2 = ? 4
** 3 x 2 = ? 6
** 4 x 2 = ? 7
No, 7 is incorrect
The correct answer is 8
** 5 x 2 = ? 10
** 6 x 2 = ? 12
** 7 x 2 = ? 13
No, 13 is incorrect
The correct answer is 14
** 8 x 2 = ? 16
** 9 x 2 = ? 1 8
** 10 x 2 = ? 20

Same / New table, or Finish (S/N/F)? S

Numerical or Random Order (N/R)? N
Shall we include stars (Y/N)? N

 1 x 2 = ? 2
 2 x 2 = ? 4
 3 x 2 = ? 6
 4 x 2 = ? 8
 5 x 2 = ? 10
 6 x 2 = ? 12
 7 x 2 = ? 14
 8 x 2 = ? 15
No, 15 is incorrect
The correct answer is 16
 9 x 2 = ? 18
 10 x 2 = ? 20

Same / New table, or Finish (S/N/F)? N

Which table? 7

Numerical or Random Order (N/R)? R
Delete on Left or Right (L/R)? R

 10 x 7 = ? 70
 6 x 7 = ? 42
 1 x 7 = ? 7
 1 x 7 = ? 7
 5 x 7 = ? 34
No, 34 is incorrect
The correct answer is 35
 7 x 7 = ? 49
 5 x 7 = ? 31
No, 31 is incorrect
The correct answer is 35
 5 x 7 = ? 35
 1 x 7 = ? 7
 2 x 7 = ? 14

Same / New table, or Finish (S/N/F)? S

Numerical or Random Order (N/R)? R
Delete on Left or Right (L/R)? L

? x 7 = 21 ? 3
? x 7 = 42 ? 6
? x 7 = 49 ? 7
? x 7 = 7 ? 2
No, 2 is incorrect
The correct answer is 1
? x 7 = 70 ? 10
? x 7 = 49 ? 7
? x 7 = 14 ? 2
? x 7 = 70 ? 10
? x 7 = 7 ? 0
No, 0 is incorrect
The correct answer is 1
? x 7 = 7 ? 1

Same / New table, or Finish (S/N/F)? F

Ready:
```

Fig. 4

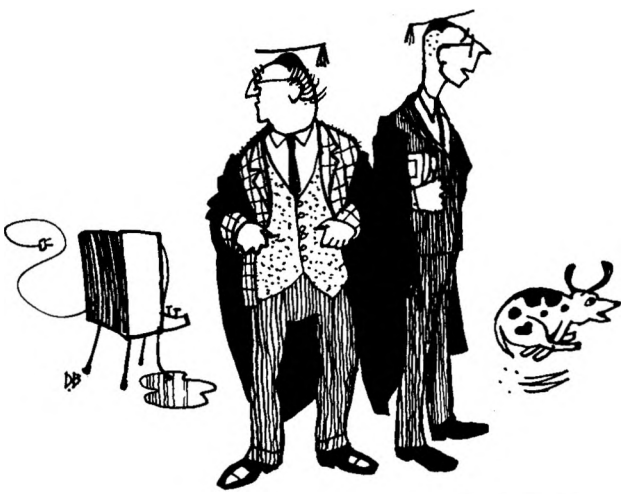
THE CLOZE PROCEDURE

In this issue we take a look at a flexible approach to the teaching of the Cloze Procedure. The Bullock Report describes this as "the use of a piece of writing in which certain words have been deleted, and the pupil has to make the maximum possible use of the context cues available in predicting the missing words". In the example given here the first gap could vary from simple words such as "all" or "the" to more descriptive text such as "bleak", "Canada's" or "scarcely populated".

```
   In ----- northern lands the -----
is short and ----- winter is long
----- cold . Life ----- a continual
battle ----- the grim powers -----
nature ! against ----- cold and the
----- , the snow ----- ice of winter
----- bitter winds the ----- rocks
where no ----- thing will grow -----
against the terrors ----- dark
mountains and ----- haunted ravines .
```

It is more than a mere gap-filling exercise, because the discussion which follows the attempt of an individual or group to complete the passage involves a critical examination of language, structure, context, meaning and style. The child is in a genuine searching situation in which there is no single right answer. The teacher only requires justification of a choice of words on the grounds of contextual aptness. Obviously therefore there may be several correct answers, and no computer program can take account of all the possibilities - just think of all the available alternatives if the missing word is a colour.

All the program does is to suggest a possible answer for each deletion. This can be done one word at a time in response to each input, or the complete set of deleted words can be displayed at the end of the passage. This is determined by the teacher. To achieve the former mode simply remove line 900.



'I wonder what it said to the Caretaker's dog'.

The program is intended for use in a group situation, as interaction with other pupils is crucial in advancing vocabulary and improving verbal skills and understanding. The program simply provides a stimulus, but a very flexible one. The 'menu' shown below demonstrates this flexibility:

```
          CLOZE PROCEDURE
          ===============

        WHICH PASSAGE (1-5)?   2

DO YOU WANT INTRODUCTION (Y/N)?   Y

        RATE OF DELETION (2-9)?   6

        PARTS OF WORDS (Y/N)?   Y

        STANDARD GAP (Y/N)?   N
```

```
WORD PARTS....

A) FIRST LETTER LEFT
B) LAST LETTER LEFT
C) FIRST HALF LEFT
D) SECOND HALF LEFT

WHICH OPTION (A-D)?
```

At present five passages are stored, but (as you can see from the listing) the teacher can easily extend the number of passages or alter the level of difficulty of the existing ones. The first line of the menu then enables you to call up whichever passage you want. The remaining questions determine the presentation. The introductory lines can be left intact without any deletions, to set the context and style. If every second word is to be deleted the rate is set at 2, and so on up to a deletion rate of nine, always from a random starting point. If "standard gap" is selected, five dashes will be used to indicate a deletion, regardless of the length of the missing word - the alternative is to represent each letter in the missing word by a dash. There is an extension to the latter possibility indicated by the expression 'parts of words'. Instead of deleting a whole word it is possible just to omit a selected part, as follows:-

a) all but the first letter,

b) all but the last letter,

c) the second half of the word,

d) the first half of the word.

These choices allow endless possible presentations depending upon age and ability level. The menu shown on the previous page, with option B selected, generates the following passage.

```
   While everyone was busy talking
over their coffee Harry decided that
his chance had come . He knew that he
--s too small to work the ---t so he
decided to climb -p all the stairs
and look --t of a window on the --p
floor . He went quietly -o the front
door but the ----h was much too high
and -e could not reach it . -e
wandered sadly back through the
-----g room and out on to --e balcony .
Harry stared through --e bars . He
tried to --e for hundreds of miles ,
--t he could not see over --e tops of
the trees .
```

Perhaps you can now guess the sequence of inputs to the menu that produced the passage at the beginning of the article.

A few points of programming interest:

1) The passage is displayed on the graphics area and not in text mode. This avoids scrolling and the possibility of losing the beginning of the text off the top of the screen.

2) Each time a word is input, a pupil can type D and see an immediate display of the passage with the word inserted into its correct position. An example of this is illustrated below:

```
Please type what you think the
word should be...

WORD 1 =? EVERY

Actual word could have been 'the'

WORD 2 =? HOWEVER

Actual word could have been 'and'

WORD 3 =? DANGEROUS

Actual word could have been 'long'

WORD 4 =? EXISTENCE

Actual word could have been 'Life'

WORD 5 =? D
```

In the northern lands EVERY summer is short HOWEVER the winter is DANGEROUS and cold . EXISTENCE is a continual ----- against the grim ----- of nature ; ----- the cold and ----- darkness , the ----- and ice of ----- the bitter winds ----- bare rocks where ----- green thing will ----- and against the ----- of dark mountains ----- wolf haunted ravines .

3) The menu is written so that any false inputs are ignored. For example, it will ignore a rate of deletion of 12 or a request for passage number 8.

4) The ability to demonstrate possible solutions after each input or at the end of the passage could be incorporated into the menu, as compared to altering one line of the program as at present.

5) The program could be extended in its scope. In particular it could be arranged for the pupils to input all the words they consider feasible for any one specific gap, and for those words to be stored for later recall by the class teacher, or to be output to a printer. A further extension, now being written, is the facility, after completing the exercise, to go back and change certain words if a group can suggest improvements to the completed passage.

By the use of the Cloze procedure the teacher can gain real insight into a child's reading strategies by listening carefully to the discussion and by studying the words that the child chooses. He can take the opportunity of pointing out cues that the child has missed, and strategies that the child has failed to use. These strategies develop naturally in many readers, but where they do not it is the teacher's responsibility to teach them. The computer can do no more than suggest possible answers and provide the stimulus to trigger off discussion, but with a variability in the passage to suit all age and ability levels.

Roger Keeling.

```
10 REM ******** CLOZE 32K **********
20 REM ******** AUTHOR  Newman College
30 CLEAR 1000:GRAPH 1:PUT12
35 CD=1
40 DEF FNX(U)=50.5*U+141.5
50 ON BREAK GOTO 950
60 RANDOMIZE
70 DIM A$(300),X(300),C$(100)
80 PLOT 0,0,2:LINE 79,0:LINE 79,59:LINE 0,59:LINE 0,0
90 PLOT 67,0:LINE 67,59
100 FOR Y=45 TO 9 STEP -9
110 READ A$:PLOT 65-2*LEN(A$),Y,A$
120 NEXT Y
130 PLOT 20,54,"CLOZE PROCEDURE"
140 PLOT 20,51,"==============="
150 AR=1
160 FOR Y=45 TO 9 STEP -9
170 IF Y=9 AND I(2)=89 THEN I=78:T=1:GOTO 270
180 PLOT 71,Y,FNX(AR)
190 I=GET(10):IF I=0 THEN AR=-AR:GOTO 180
200 PLOT 71,Y,192
210 IF I=89 OR I=78 OR I=121 OR I=110 THEN T=1:GOTO 240 ELSE T=0
220 IF Y=45 THEN U=53:L=49 ELSE U=57:L=50
230 IF I<L OR I>U THEN 180
240 IF T=0 AND Y<>45 AND Y<>27 THEN 180
250 IF T=1 AND (Y=45 OR Y=27) THEN 180
260 IF T=1 AND I>90 THEN I=I-32
270 PLOT 73,Y,I
280 IF T=0 THEN I(Y/9)=I-48 ELSE I(Y/9)=I
290 NEXT Y
300 P=I(5):I$=CHR$(I(4)):R=I(3):P$=CHR$(I(2)):SG$=CHR$(I(1))
310 UU=GET(200)
320 TEXT:PUT12
330 IF P$="N" THEN 430
340 ?"WORD PARTS...."
350 ?:?:?"a) FIRST LETTER LEFT":?"b) LAST LETTER LEFT"
360 ?"c) FIRST HALF LEFT":?"d) SECOND HALF LEFT":?:?
370 ?"WHICH OPTION (A-D)? ";
380 OP$=GET$()
390 O=ASC(OP$):IF O>70 THEN O=O-32
400 IF O<65 OR O>68 THEN 380
410 ?OP$:UU=GET(50)
420 O=O-64:PUT12
430 REM ******* PASSAGE BIT *********
440 IF P=1 THEN RESTORE 1220
450 IF P=2 THEN RESTORE 1250
460 IF P=3 THEN RESTORE 1330
470 IF P=4 THEN RESTORE 1380
480 IF P=5 THEN RESTORE 1420
490 K=1
500 READ A$(K)
510 IF A$(K)="****" THEN 530
520 K=K+1:GOTO 500
530 N=K-1
540 B=INT(RND(1)*6)+1
550 IF I$="Y" THEN B=B+20
560 U$="````````````````````````":K=0
570 FOR L=B TO N STEP R
580 IF L>N THEN L=N:GOTO 720
590 A$=A$(L):LN=LEN(A$):H=INT(LN/2)
600 IF SG$="Y" THEN LN=5
610 IF H=0 THEN L=L+1:GOTO 580
620 IF ASC(A$)<65 THEN L=L+1:GOTO 580
630 ON O+1 GOTO 640,650,660,670,680
640 A$=LEFT$(U$,LN):GOTO 690
650 A$=LEFT$(A$,1)+LEFT$(U$,LN-1):GOTO 690
660 A$=LEFT$(U$,LN-1)+RIGHT$(A$,1):GOTO 690
670 A$=LEFT$(A$,H)+LEFT$(U$,LN-H):GOTO 690
680 A$=LEFT$(U$,H)+MID$(A$,H+1):GOTO 690
690 REM ***?!
700 K=K+1:X(K)=L:C$(K)=A$(L)
710 A$(L)=A$
720 NEXT L
730 GOSUB 1080
740 PUT12
750 ?"Please type what you think the"
760 ?"word should be...":?
770 FOR L=1 TO K
780 ?"WORD";L;"=";
790 INPUT LINE G$:F=0
795 IFCD=1AND(G$="D" OR G$="d")THENGOSUB1080:GOTO780
800 IF G$="" THEN 780
810 FOR Q=1 TO LEN(G$)
820 V=ASC(MID$(G$,Q,1)):IF V>90 THEN V=V-32
830 IF V<65 OR V>90 THEN F=1
840 NEXT Q
850 IF F=1 THEN ?:?"EH??  -LETTERS ONLY !!":?:GOTO 780
860 PUT12
870 A$(X(L))=G$:IFCD=0THENGOSUB 1080
```

```
880 REM +++++++ ANSWERS MODIFICATION +++
890 REM +++ M=1 Continuous, M=2 Batched+
900 M=2
910 REM ++++++++++++++++++++++++++++++++
920 IF M=2 THEN 940
930 ?:?"Actual word could have been '";C$(L);"'":?
940 NEXT L
945 IFCD=1THENGOSUB1080
950 ?CHR$(12):UU=GET(300)
960 IF M=1 THEN 1060
970 PLOT 0,0,"These are some possible answers..."
980 FOR L=1 TO K STEP 2
990 ?CHR$(12);"Word";L;"= '";C$(L);"'";
1000 IF L=K THEN ?:GOTO 1020
1010 ?TAB(18);":Word";L+1;"= '";C$(L+1);"'"
1020 ?:?"Press any key";:UU=GET()
1030 NEXT L
1040 PLOT 0,0,"                                        "
1050 ?CHR$(12):INPUT"Do you want to return to menu";Q$:IFLEFT$(Q$,1)="Y"THENRUN
1060 TEXT:PUT12:END
1070 REM ******** PLOTTER *************
1080 X=6:Y=54:GRAPH 1
1090 FOR LL=1 TO N
1100 LN=LEN(A$(LL))*2+2
1110 IF LN=4 THEN 1140
1120 IF X+LN>76 THEN X=0:Y=Y-3
1130 IF Y<3 THEN 1170
1140 PLOT X,Y,A$(LL)
1150 X=X+LN
1160 NEXT LL
1170 RETURN
1180 REM*******DATA**********
1190 DATA WHICH PASSAGE (1-5)?,DO YOU WANT INTRODUCTION (Y/N)?,RATE OF DELETION (2-9)?
1200 DATA PARTS OF WORDS (Y/N)?,STANDARD GAP (Y/N)?
1210 REM *************************
1220 DATA My,house,has,a,red,roof,and,a,brown,chimney,.,The,door,and,the,windows
1230 DATA are,blue,.,Will,you,come,and,play,with,me,?,We,can,have,cakes,and,buns,to,eat
1240 DATA We,will,run,and,skip,and,jump,in,the,garden,.,Then,we,will,sit,down,and,rest,.,****
1250 DATA While,everyone,was,busy,talking,over,their,coffee,Harry,decided
1260 DATA that,his,chance,had,come,.,He,knew,that,he,was,too,small,to,work,the,lift
1270 DATA so,he,decided,to,climb,up,all,the,stairs,and,look,out,of,a,window,on,the
1280 DATA top,floor,.,He,went,quietly,to,the,front,door,but,the,catch,was,much
1290 DATAtoo,high,and,he,could,not,reach,it,.,He,wandered,sadly,back,through,the
1300 DATA living,room,and,out,on,to,the,balcony,.,Harry,stared,through,the,bars
1310 DATA .,He,tried,to,see,for,hundreds,of,miles,",",but,he,could,not,see,over,the
1320 DATA tops,of,the,trees,.,****
1330 DATA In,the,northern,lands,the,summer,is,short,and,the,winter,is,long,and
1340 DATA cold,.,Life,is,a,continual,battle,against,the,grim,powers,of,nature,;
1350 DATAagainst,the,cold,and,the,darkness,",",the,snow,and,ice,of,winter,the,bitter
1360 DATAwinds,the,bare,rocks,where,no,green,thing,will,grow,and,against,the
1370 DATA terrors,of,dark,mountains,and,wolf,haunted,ravines,.,****
1380 DATA I,have,got,lots,of,toys,.,They,are,very,old,but,I,like,them,.,I,have
1390 DATAsome,pets,.,My,cat,is,black,and,my,dog,is,white,.,My,goldfish,lives,in,a
1400 DATAlittle,tank,and,my,rabbit,lives,in,a,big,cage,.,I,never,forget,to,feed
1410 DATAthem,before,I,go,to,school,and,when,I,get,home,****
1420 DATA One,day,John,and,Susan,were,by,the,lake,.,Their,dog,Patch,was,there
1430 DATAas,well,.,Patch,was,a,black,dog,with,a,white,patch,over,one,eye,.,This
1440 DATAgave,him,a,wicked,look,.,He,looked,like,a,pirate,.,That,day,by,the,lake
1450 DATA",",they,all,looked,like,pirates,.,John,was,called,Black,John,.,He,had,a
1460 DATApirate's,hat,and,a,patch,over,one,eye,.,****
```

'I said we shouldn't have put him in goal!'

Have You Written Any Good Programs Lately?

If you have just removed the last bug, or so you think, from your latest programming masterpiece - what next? Do you distribute it free to as many schools as possible in the hope of receiving constructive criticism or look for a means of distribution that will give you some financial return? In advocating the former policy, we have expressed the following reservations about the sale of software:-

a) It restricts generous exchange of programs, essential for testing and feedback.

b) There may be a substantial difference between one's expectation of a program and what it actually does. It is one of the very few products we buy 'blind', and it could well be that novices who think their money has been wasted will be prevented from voicing genuine criticism.

c) Most programs are written (or should be) as the result of discussion between groups of teachers and a programmer. Is the latter any more entitled to the revenue than the former?

d) If a program is rewritten, how much of any revenue should belong to the original author? Who is entitled to the revenue if the program is developed in school time on an LEA machine?

Now there are two sides to every argument and I am grateful to Charles Sweeten, the MUSE software librarian, for replying to the above points.I quote from his reply.

> "Selling v. free: My experience was that free programs were not accessed from the Library and very poor quality stuff was submitted for distribution. Everyone with quality software hung on to it himself in the hope of making some money out of it. The flood of software being offered now is,I am convinced, a result of being able to offer something to the authors.
>
> "Testing and feedback: I am getting very little feedback on programs in the MUSE Library. I suspect that you are getting considerably more back but I also suspect that feedback comes as a result of a positive search for feedback. The difficulty comes particularly once one has got over about a dozen programs. Trying to cope with positively finding reactions to 70 programs cannot be done in one's spare time. Several of us are beginning to think that the only way of dealing with this is to have a professional service and do the job properly.

"Buying blind: This is a real difficulty of course. If we send material out on appro, if it is being sold, then obviously it is going to get copied. On the other hand, we must have a mechanism whereby people can view what they are thinking of buying. I think the answer is to have software workshops and demonstrations on a very wide basis throughout the country which means that teacher centres and training colleges have got to take a very active part in buying available software, testing it for suitability and giving honest opinions to feeder schools about what would be suitable. I would like to see much stronger review sections for software in places like 'Computers in Schools' and other educational magazines.

"Groups of teachers and the programmer: It is always very difficult to assess the commercial worth of an idea as against the number of hours spent on development. The same problem applies to books of course. If a teacher talks to a large number of colleagues and gets his ideas sorted out, then writes a book, it is only the author of the book that gets the return. I am not entirely happy with this argument and I think in practice that each situation is going to have to be viewed in its own light and will depend on the sort of teacher discussions that have taken place and what sorts of institutions are involved. I would wish to be extremely flexible on this point.

"Rewriting a program: I am sure that any revenue obtained should be shared between the original author and the rewriter but how this is shared should depend on the amount of work done by each person. The case has arisen recently where a program was submitted originally and has since been modified by two other people in a major way. In this particular case the original author is being given the whole amount."

Obviously we can see that the whole area is fraught with problems, to which there are no absolute answers.

The MUSE software library is a genuine attempt to validate programs and to distribute them at a modest charge, whilst at the same time it can offer some reward to the author. At the other extreme, it is the 'private enterprise' individual we are particularly wary of. Anyone can put together a poor program, make exaggerated claims for it, sell it for £5 and leave a dissatisfied customer no come back when he realises the poor quality. This could quickly disillusion many teachers who innocently part with their annual capitation in the expectation of receiving quality software. Perhaps we may one day hear of the distraught teacher explaining to the judge that she was driven to software piracy after having been 'conned' by the false claims of programmers.

There are many problems still to be solved and we invite comments from interested readers. In particular I hope that the MEP will provide guidance on the subject before commercial organisations step in and dictate the ground rules - are you listening up there in Newcastle?

Roger Keeling

Charles Sweeten has the last word:

> "Commercial organisations are stepping in already in large numbers. Computer manufacturers already have a poor reputation and now everybody, it seems, is trying to get in on the act. MUSE is offering a professional assessment and review service to these organisations to try and improve the situation, and MUSE also operates a development service. It may also be of interest that MUSE is about to produce standards for Assessment. I share Roger Keeling's concern about standards, about buying blind, and about feedback, but I do believe that a good service (provision of quality software) has to be paid for in the end, or it is likely to fold up when one key individual leaves."

Footnote: MUSE Software Library is at MUSE, FREEPOST, Bromsgrove, Worcs. B16 0JT.

CALCULATORS IN THE PRIMARY SCHOOL-2

Developing guessing strategies with a calculator

Many teachers use numerical investigations to help their pupils to develop a logical outlook. Progress is often severely hindered by long and complex calculations or even by simple calculations which have to be carried out a great many times.

It is quite possible to play all three games described in this article, and to develop the best strategies, without recourse to a calculator. It is hoped however that using a calculator will enable strategies to be developed more quickly and clearly. Its use should also allow some children who lack confidence in numerical manipulation, but who nevertheless may comprehend general relations, to extract maximum benefit from investigations of this kind.

* * * * * * *

Game A - Guessing a number chosen from a pre-determined range.

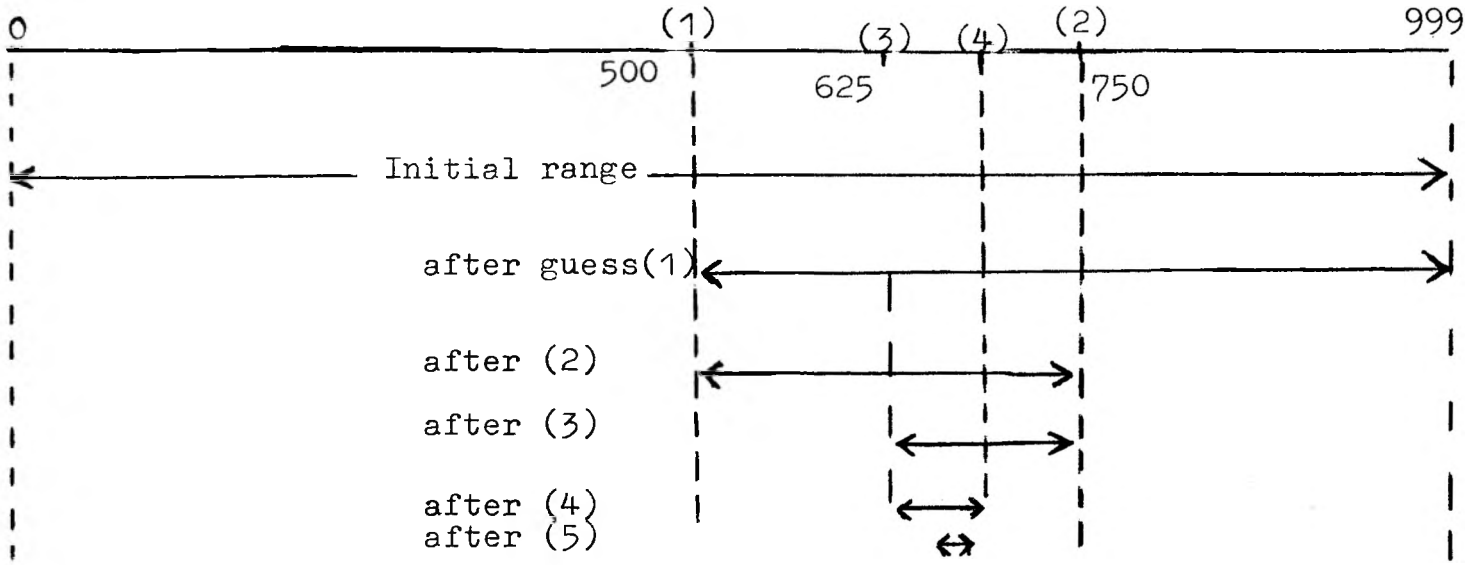
Two children play: one uses a calculator to help guess a number which has been chosen by the other child. Let us suppose that John can select any number from 0 to 999. When Mary makes a guess, John's reply states whether the guess is too high, too low or correct. Mary is allowed to use pencil and paper to keep a record. At first, Mary may guess wildly and the calculator is of little use at this stage. Later, as Mary begins to search for a good strategy, the calculator becomes more useful. Since each reply reduces the range of numbers in which the unknown number can still lie, Mary may eventually decide to divide the range by two at each successive guess. A careful record of the current upper and lower limits of the range can be kept with just paper and pencil, but a calculator with two memories will efficiently calculate and store the new limits after each guess. An example illustrates the best strategy:-

Play 1. John chooses 671.

Mary's guess	John's reply	Mary's record		Mary's calculation
		Higher limit	Lower limit	
(1) 500	Too low	1000	500	(1000+500)/2=750
(2) 750	Too high	750	500	(750+500)/2=625
(3) 625	Too low	750	625	(750+625)/2=687.5*
(4) 687	Too high	687	625	(687+625)/2=656
(5) 656	Too low	687	656	(687+656)/2=671.5*
(6) 671	correct			

* Rounded down to whole number below.

Mary's guesses and how she divides the range successively in two are illustrated below:



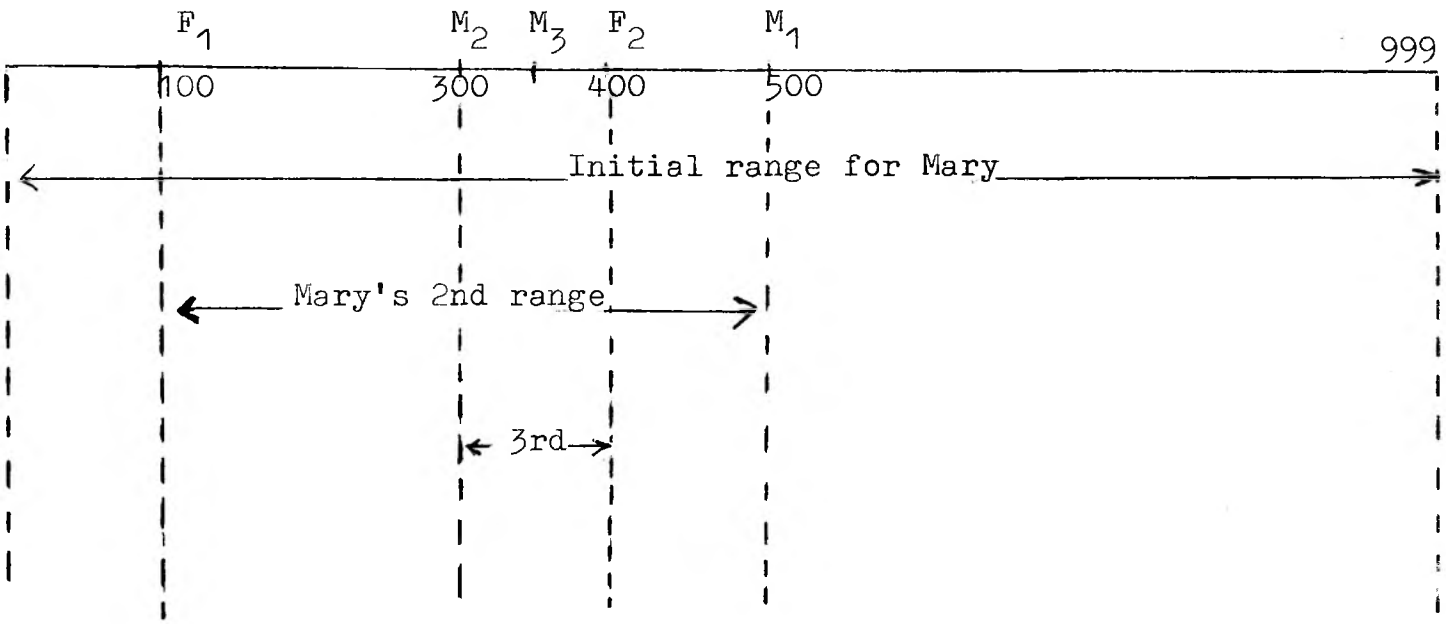
Mary has taken six guesses. Clearly the least number of guesses possible is one - but what is the least number of guesses Mary must make to guarantee success, whatever number is chosen within the range? The answer to this is left for the reader's pupils to provide.

When both players know the best strategy the chooser may experiment in selecting numbers to see if the task of the other child can be made more difficult.

A variation on this game involves a number of pupils guessing in turn. A child who knows the strategy can make use of information gained even from the wild guesses of those who don't. This is illustrated below, with Mary knowing the strategy and Fiona guessing wildly.

Play 2. Let John choose 326.

Mary's guess	Fiona's guess	John's reply	Mary's calculation
500		Too high	
	100	Too low	(500+100)/2=300
300		Too low	
	400	Too high	(300+400)/2=350
350		Too high	
	310	Too low	(350+310)/2=330
330		Too high	
	322	Too low	(330+322)/2=326
326		Correct	



A further development of this game requires the children to investigate how many extra guesses are required to guarantee success if the range for the choice of number is doubled, quadrupled etc. They will be surprised at the results. A calculator will be a great boon in averaging two four- or five-digit numbers.

* * * * * *

Game B - Guessing the operation

John and Mary have a calculator each and John chooses an operation like "add 5", "multiply by 3", or even "double it and subtract 1". (Division is not recommended for primary school pupils without additional constraints on the game.) Mary then names a number and John calculates the result of applying his operation to this number and gives Mary the result. Mary records this on paper and then names another number, noting John's reply. This cycle is repeated until Mary manages to guess (or deduce) John's chosen operation. John will be using the calculator continually whilst Mary will probably use it only occasionally:-

Play 1.

Mary names	John calculates	John replies
10	10+20 =	30
20	20+20 =	40
25	25+20 =	45
12	12+20 =	32

At this point Mary can compare her record of named numbers with the replies and will (hopefully) guess that the operation is 'add 20'. A rule involving subtraction alone will give rise to a game similar to the one above. No illustration is given here for operations which are mixtures of addition and subtraction - children readily deduce that every such case reduces to a single addition or subtraction e.g. "add 15 and then subtract 7" is equivalent to "add 8".

The operation of multiplication, taken on its own, does not present much more difficulty, especially for able children. A far greater challenge is the mixing of multiplication with either addition or subtraction and this is illustrated in the following example:

Play 2.

Mary names	John calculates	John replies
5	2x5+3 =	13
8	2x8+3 =	19
10	2x10+3 =	23

etc.

Mary may not make much progress until she realises that, for example, the increase from 19 to 23 is caused by the multiplying factor alone acting upon the increase from 8 to 10, i.e. 2⟶4. This helps Mary to deduce that the multiplying factor is 2. She can use this with her first chosen number (5x2=10) and note that this is 3 less than John's reply. Hopefully Mary will deduce that the addition operation is "add 3" and that the complete operation is "multiply by 2 and then add 3". (Of course, "add 3 then multiply by 2" is different.) Before informing John of her guess Mary can check the guessed rule with her own calculator. Mary may make many attempts involving sheer guess-work before she starts to apply a good strategy. It may be advisable initially to restrict the range of operations available from which John can choose.

Of course, examples involving small whole numbers can usually be worked mentally or using pencil and paper. The calculator, however, has some advantages even at an elementary level: (a) it speeds up the calculations and makes the game more interesting; (b) it helps to reduce errors in the calculations; (c) it encourages exploration of a wide range of "input" numbers, from which a good strategy can be developed. For children who wish to choose operations such as "multiply by 3.7 and then add 6.4" or inputs such as 2.5, the use of a calculator is very desirable. Teachers who structure the game more rigidly may help their children to discover many properties of decimals. Many children will eventually arrive at the very best strategy which guarantees the correct answer to any "multiply then add" operation in just two guesses. Readers are invited to see how long it takes their own pupils and the author would be pleased to learn of teachers' own experiences with pupils.

In an extension to this game children would deduce, for example, that "add 3 and then multiply by 2" is the same as "multiply by 2 and then add 6". This could lead to more complex equivalent operations such as "multiply by 4 then add 12 then divide by 2". The calculator is used at each stage to check the children's guesses.

Finally, a further investigation is to see for which numbers an operation such as "multiply by 3, then add 2" gives the same results as "multiply by 2,then add 3". The result will probably surprise most children, there being a unique result for "multiply and then add" and a different but also unique result for "multiply and then subtract".

Game C - Guessing a repeated operation

This game is related to work in the last year of primary school. The children are asked to find a single operation which is repeated a given number of times. The input number and the final result are also given. Examples are:"Use the same addition operation three times to get from 5 to 20", and "Use the same multiplication operation twice to get from 1 to 36". The calculator is invaluable in this work because many guesses may be needed before a good strategy is formed. The approach outlined below relies on the use of a calculator to check each guess rapidly - the results are used to indicate the next guess. "Use the same multiplication operation twice to get from 2 to 338".

Step	Guess	Calculation	Decision
1	6	2x6=12,12x6=72	72 < 338, 6 too low
2	20	2x20=40,40x20=800	800 > 338, 20 too high
3	12	2x12=24,24x12=288	288 < 338, 12 too low
4	14	2x14=28,28x14=392	392 > 338, 14 too high
5	13	2x13=26,26x13=338	Multiplier is 13.

This game has many possibilities which are left for the reader to explore.

Alan James.

Useful Publications

1. FREE from Council for Educational Technology, 3 Devonshire Street, London W1N 2BA:
   CET Information Sheets - No.1, "Thinking about microcomputers: first steps", provides a list of references and contacts; No.2, "Educational aspects of new technologies", summarises CET involvement in current developments; No.3, "Telesoftware", explains innovations of great significance (see P.9)

   "Protection of Computer Programs" attempts to clarify some problems of copyright.
   "USPEC 32" is a guide to the selection of microcomputers.
2. From Project Secretary, I.T.M.A., College of St Mark and ST John, Derriford Road, Plymouth, Devon PL6 8BH:
   "Development and Evaluation of Materials and Methods of Use" - a discussion document (10p).
   "Teaching Style and Program Design" - analysis of design possibilities for class teaching material (£1.50)
   "CIassroom Development of Teaching Material" (£2.00)
   "Practical Considerations in the Creation of C.A.L. Teaching Units (50p.)
3. From R.J. Margetts, Bristol Polytechnic, Coldharbour Lane, Bristol BS16 1QY
   A newsletter packed with up-to-date references (Sept.1981)
4. From Research Machines Mill Street, Oxford OX2 OBW, a newsletter (Sept.1981).

380Z Primary Software

In 'MICRO-SCOPE 1' we described a number of programs suitable for use in the primary school. They will only run on a 380Z or 480Z. We can now offer additional programs, which are also freely available to schools. However, as we believe in the free exchange of software, we would appreciate receiving at least one primary program in exchange for the ones we are sending out.

1) CLOZE - as described in more detail in this issue.
2) MATCH* - shape recognition for early infants.
3) KP - a contribution from Dave Fisher, Coventry, to provide keyboard practice for early infants.
4) ENGLAND* - suitable for top juniors, to develop atlas skills.
5) PUNCT - punctuation practice for juniors.
6) DIAGRAM* - similar to the previous version of DIAGRAM, but now uses high resolution graphics and any bearings.
7) HANDWRT* - for 4 to 6 year olds, showing dynamically the formation of letters of the alphabet.
8) ECHO - primary science, associated with illustrating the speed of sound.

These programs will be available as from December 1st. They require disc or cassette BASIC, version 5. Those marked with an asterisk need a high resolution graphics board. Send a 40-track disc or C60 cassette with 25p for postage (or 75p to include the documentation booklet) to Roger Keeling, Newman College.

NEWMAN COLLEGE

IN-SERVICE COURSES FOR TEACHERS

IN PRIMARY EDUCATION

SCIENCE

Diploma in Science Education for Teachers in Primary Schools - September 1982

It is a two year part-time course leading to an advanced diploma of the University of Birmingham. The course provides an opportunity for primary school teachers to improve their background knowledge of Science. Teaching is centred on a series of topics and materials appropriate to the primary school curriculum. One of the main aims of the course is to increase the confidence of teachers in Science and so enable them to develop schemes of work and to evaluate teaching programmes. A real interest in the subject is more important than previous knowledge.

Early application is advised since the number of teachers that can be accommodated is limited by the space available for practical work.

A DES/Regional Short Course

Science in the Primary School -a course for Heads, Deputy Heads and teachers with posts of responsibility for Science. The course will examine the role of the Headteacher or teacher leader in introducing Science into the curriculum of the Primary School.

The course is organised on a half-day or one-day weekly basis from January - April 1982.

COMPUTING

A Short Course - Microcomputer Workshop for Primary Teachers

Six full days - April 29 and 30, May 10 and 17, May 24 and 25, 1982.

The aim is to give interested primary teachers an opportunity to concentrate on the design and evaluation of software. This includes the formulation of new ideas and a critical assessment of existing software.

Proposed Diploma Course

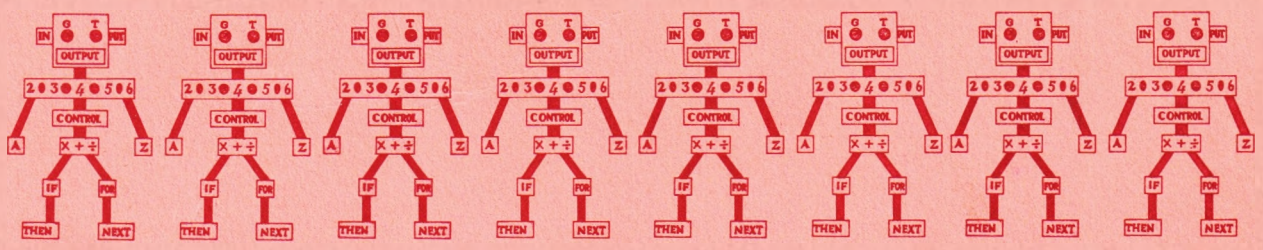
A diploma course in Computer Education for teachers of pupils in the 5-13 age range is planned to start in September 1982.

The aim of the course is to provide teachers with the expertise to introduce and exploit the microcomputer as an aid to the education of primary children. It is expected that teachers completing the course will be able to take a positive role in the in-service education of their colleagues within their own school and L.E.A.

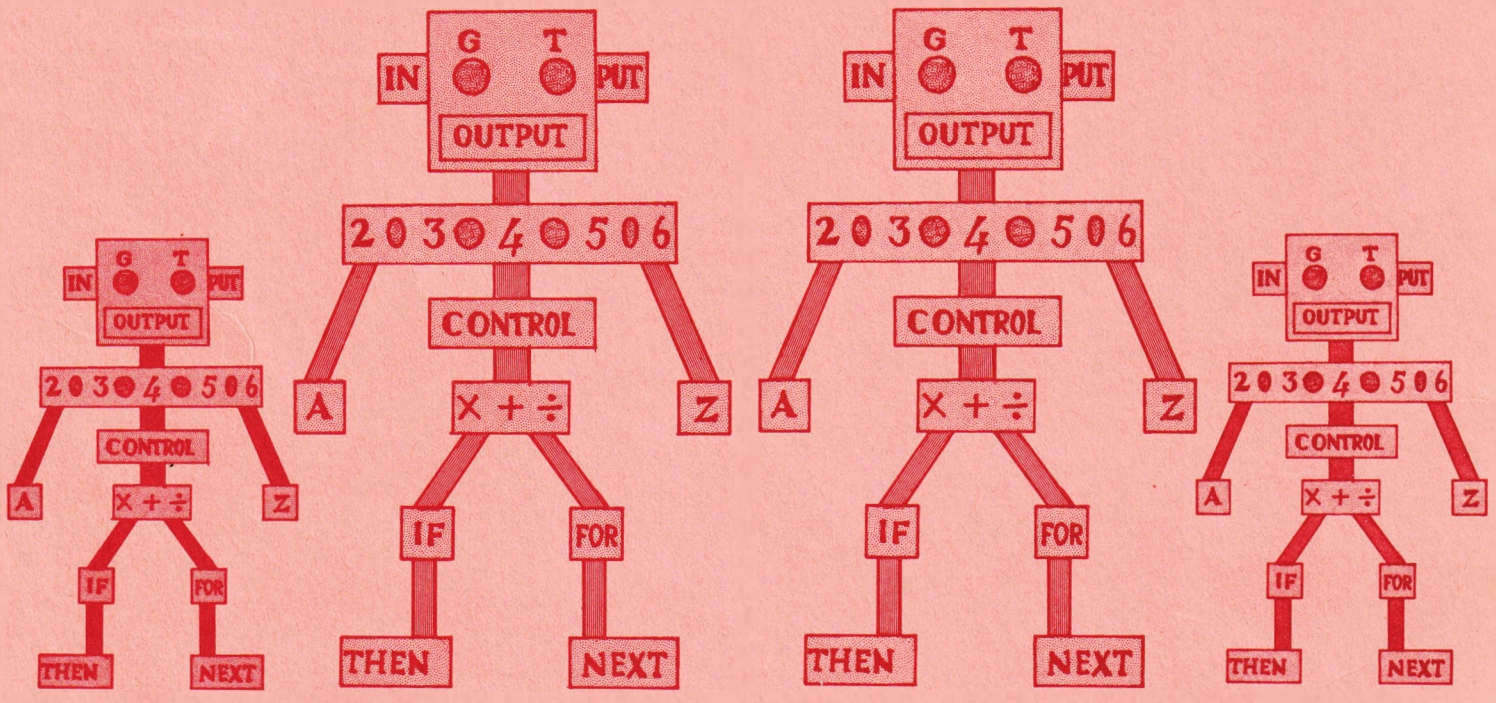
It is hoped that, if there are enough applicants able to get secondment, it will be run as a one-year full-time course.

All enquiries and applications to:- The Registrar, Newman College, Bartley Green, Birmingham. B32 3NT

Telephone 021-476 1181 Ext. 54


G T
IN PUT
OUTPUT
2 0 3 4 5 0 6
CONTROL
A X + ÷ Z
IF FOR
THEN NEXT

MICRO-


G T
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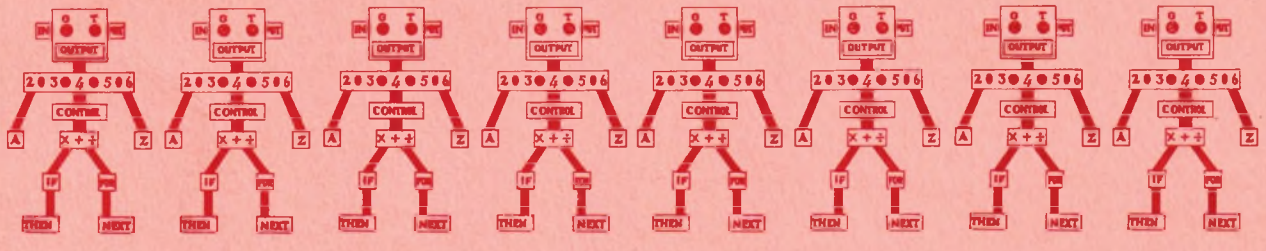
CONTROL
A X + ÷ Z
IF FOR
THEN NEXT

SCOPE


G T
IN PUT
OUTPUT
2 0 3 4 5 0 6
CONTROL
A X + ÷ Z
IF FOR
THEN NEXT