MICRO-SCOPE 5

MARCH 1982

Newman College with MAPE

MICRO-SCOPE 5

(MICROcomputer Software Co-Operation for Primary Education

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EDITORIAL

With this issue we extend a warm welcome to our new partners. MAPE promises to be a significant movement through which teachers in primary schools can share their experiences, express their needs and ideas, and help to shape development. "MICRO-SCOPE" holds the same principles: we look forward to a long and productive association.

Important issues have still to be resolved. Mandated to prepare a Constitution, the Steering Committee has already come up with a fast-growing membership and a journal! A familiar union model is to be considered, with an Annual Conference to formulate policy; a regional network; and postal elections to a Council. Democratic control matters. MAPE will speak powerfully for teachers to determine vital resources and far-reaching changes.

"MICRO-SCOPE" will reflect the organisation and policy of MAPE. The challenge of moving to a national platform has already widened our circle of contributors, and enabled us to initiate new themes. This is our "Turtle Geometry" issue, with a section headed by Mike Thorne on BIGTRAK. References by Mike, and by Barry Holmes in his article on Simulations, to Piaget, Bruner and Papert give notice that we must soon give serious attention to theoretical implications. As promised, we also develop ideas on teacher-training, on the BBC contributions and on software.

From time to time we plan to examine a topic in greater depths than is possible in the regular journal. We envisage MICRO-SCOPE/ MAPE "specials" for this purpose. One devoted to children's own responses, ideas and programs has been suggested. "Beyond BASIC" is another twinkle. Please let us know if you plan a substantial contribution.

The current issue also marks the beginning of our collaboration with Heinemann-Ginn Computers in Education. Their distribution network will help us to establish new readers. Accordingly, we shall soon be phasing out the direct £1 subscription, subsidised by the D.o.I.. New readers are encouraged to secure copies by joining MAPE.

Issue No. 6 (June 1982) will be typeset by Heinemann/Ginn. We shall not continue our amiable practice of including articles received after our announced deadline! ALL copy to the Editor BY 1st MAY, please.

See you at Exeter!

M A P E MATTERS

MICROS AND PRIMARY EDUCATION

This is the first joint issue of 'MICRO-SCOPE' in association with MAPE. Ron Jones, Chairman of MAPE, takes the opportunity to launch a new regular feature under this heading. Here he introduces himself and the members of MAPE's Steering Committee; records the events which led up to MAPE's formation; and explains the importance he attaches to the development of a strong national organisation in this field.

The purpose of this series will be to keep members aware of current developments and from time to time to allow for some crystal ball gazing. For the first feature, as in a way history is being made, I will take a 'for the records' approach.

The steering committee is made up of two LEA advisers (Humberside and ILEA), a class teacher from the Toxteth area of Liverpool, four lecturers in Education, and one from a University Department; five heads and two deputy heads; and sadly only one female, who was an Infant Teacher when she joined us, but has since left the classroom for research - naturally into the use of micros! This represents a fair cross- section of experience of using microelectronics within the Primary/Middle School sectors, as well as being reasonably geographically scattered so that we are able to glean the needs of various regions throughout the country. There are gaps which, it is hoped, the National Conference at Exeter will fill.

In order to keep the introduction brief I have appended thumb-nail sketches of all Committee members at the end of this article. I hope that readers will make it their business to contact the Committee member in their area, not only to make their own needs felt, but also to offer to help create strong area and regional organisations. As chairman I would like to record, through this journal, my sincere thanks to all members of the Committee for their commitment to an idea, and for the very hard work that they have put into converting that idea into a reality - all within the space of nine months. Now to describe how that idea evolved and how it finally came to reality on the 1st January, 1982 - just for the record!

The idea had been sown in my mind long before April, 1981 (the date the Steering Committee was appointed). It began one evening in May 1978, four years before the launch of Information Technology Year, when I saw that quite remarkable B.B.C. Television 'Horizon' programme "Now the Chips are Down". Not only did it stir Prime Minister Callaghan into immediate action, but it also had drastic effects on some Primary schools throughout the country. My own school was one of those - for myself and my staff it was like receiving a body blow. We had done our very best, with the resources at our disposal (and more besides!) to keep our children abreast of technological developments so that they would be able to cope with whatever they met in the real world. But here was a world we did not recognise. In our rural backwater, on the very edge of the Cambridgeshire Fens - the Chip had passed us by.

The 'Horizon' programme revealed to us a window into the world of tomorrow - a world which is of very real relevance to children within the Primary School - to children in the first stage of their formal education. These are the men and women who could be and indeed must be educated to play a vital role in that world of tomorrow - that is if all our people are to prosper.

The momentum, started by B.B.C. television, was given further impetus by the Council for Education Technology in December 1978 when it published a brief pamphlet entitled 'Microelectronics: Their implications for Education and Training' (1) This important paper threw down four challenges to all of us in education - which are as relevant today as they were in 1978. They are:

- What can we do to help people to prepare themselves for a rapidly changing society?
- What can we do to help people fit themselves for employment in new and technologically advanced occupations?
- What can we do to help people fill their leisure hours - whether the result of a reduced working week, or the enforced leisure of unemployment?
- What can we do to help people to maintain their self-esteem when there are no jobs for them?

'Old Wheatgerm can make it do anything.'

CET's final paragraph in that pamphlet is pertinent even for Primary Schools - and this I hope explains the rush to launch MAPE:

> "But there is not unlimited time. If a change is coming it will come with unprecedented speed. We need to think and to act with courage and resolution."

Although the CET paper was not of course pitched at Primary Schools, I recommend that every reader of MICRO-SCOPE gets hold of a copy (it is free from CET). It is hard-hitting but helps to establish the background of creation of the Primary Schools' own national micro-electronics organisation. Unfortunately the challenge of the new technology has coincided with severe cut-backs. This has undoubtedly led to a very luke-warm response for the idea of microtechnology in Primary Schools from the D.E.S. and the majority of Primary Advisers. I think that this not only reflects financial constraints within which the official support services are working, but also a far deeper, more fundamental problem which has faced many innovations in the past - that of fear of change. The gut reaction to change is the cry 'back to basics' and 'standards'. Fortunately the recent Cockcroft Report on Mathematics has endorsed the teaching of mathematics on a broad base, even encouraging the use of calculators and a far more practical approach than 'basics' allow.

There still remains the very real problem that most of us in Primary Schools, our advisers and administrators were born in the era of the Industrial Revolution, whilst those whom we teach were born in the technological revolution - into the era of Information Technology. The gap between the teachers and the taught is enormous and requires very positive efforts on our part to enable us to leap that gap. We need retraining, re-educating. If official help cannot yet be provided, for economic or for other reasons which I have hinted, then help must be provided by the Primary/Middle Schools themselves. Hence the need for a strong central body such as MAPE which can act as co-ordinator and catalyst for both area and regional energies.

We are without doubt in a 'Change without Choice' situation which calls for vigorous leadership - if a generation of young children is not to be deprived of the skills necessary for it to cope with its world.

'Micros And Primary Education' was born out of this situation of scepticism, fear and the retreat in some cases to the cold comfort of the old order. MAPE has, however, found some very real support. I had always naïvely looked upon DES and LEA advisers as 'nursemaids' to Primary Education - but vital succour for the creation of MAPE has come not from these obvious sources but from British Petroleum, the Department of Industry, the Microelectronics Education Programme, the Council for Educational Technology and from many, many colleagues at grass-roots level. We will of course always be looking for new sources of sponsorship to help us to pursue our aims. We shall continue to look towards the world of Commerce. Some progressive companies are beginning to see the connection between their needs and ours - in my optimism I forecast that many more will follow in the not too distant future.

I seem to have digressed to the present - so I must return you to March 1980 - I was fortunate to be awarded an Associateship at Homerton

College, Cambridge, for four days per week for the Summer term, during which time I was able to conduct a survey (2) of all the schools who had introduced microcomputers into their Primary Schools. The survey uncovered only 32 such schools. This small number of pioneers was scattered throughout the country and was carrying out quite exciting and innovative work - but it was work carried out in isolation. There had been no attempt to co-ordinate the work of those schools. Their work, unlike that in the Secondary sector, which was largely locked into Computer Studies, or lodged in the mathematics departments, had crashed through the subject boundaries: computers were being used with varying success across the curriculum. The greatest problem - and it is still with us - was the lack of good, professionally - written software. This is an important area in which the MAPE organisation hopes to be able to offer help.

In an attempt to remedy the isolation and to provide a forum for schools which had taken part in the survey, a small Conference was held at Homerton College, in March 1981. It proved to be a very exciting and stimulating weekend for the participants - a weekend where they could explore together the future development of microtechnology. It was at the final session of this Conference that the idea of creating a national association was floated.

A much larger forum was provided three weeks later in April 1981, at the Exeter Conference - where the idea was again presented. The idea was well received and the Conference set up the Steering Committee, the members of which I introduced to you at the beginning of this article. The Committee was tasked with exploring the possibility of setting up a National Body. On the Monday following the establishment of the Steering Committee, Mrs. Thatcher launched her Government's Microelectronics Education Programme.

In her opening address she declared her faith in the "Keyboard Generation". Her generation, she said, had been too slow in changing to meet the opportunities of microelectronics - but children, <u>in their early creative years</u>, took to computers with enthusiasm .... MAPE is doing its best to provide children and teachers with the opportunities!

It was in June 1981, in CET's Council Chamber, that the name Micros And Primary Education and its acronym MAPE were created. The Spring and early Summer had been spent in exploring the possibilities of close co-operation with the already established MUSE organisation - but without success. Perhaps it was the wrong time to explore, for there proved to be too many problems, so the Steering Committee decided to create an autonomous organisation, with its own journal etc., which would concentrate solely on meeting the needs of the Primary/Middle School sectors of Education. It was however agreed that MAPE would continue to explore areas of common interest in the hope that mutual ground could be developed with MUSE.

The title chosen is significant - because readers, I am sure, will have noticed the absence of the word microcomputer. This was a deliberate attempt to keep the technology as broadly based as possible, because there will soon come a time when the microcomputer itself will be one small part of the total system - an Information Technology System - and

MAPE must adapt to such developments in the future.

Also worth noticing is MAPE's statement of aims - for the Steering Committee sweated blood in devising it! It is as follows:-

> "Micros And Primary Education (MAPE) is a national organisation which aims to promote and develop the awareness and effective use of microelectronics as an integral part of the philosophy and practice of Primary Education."

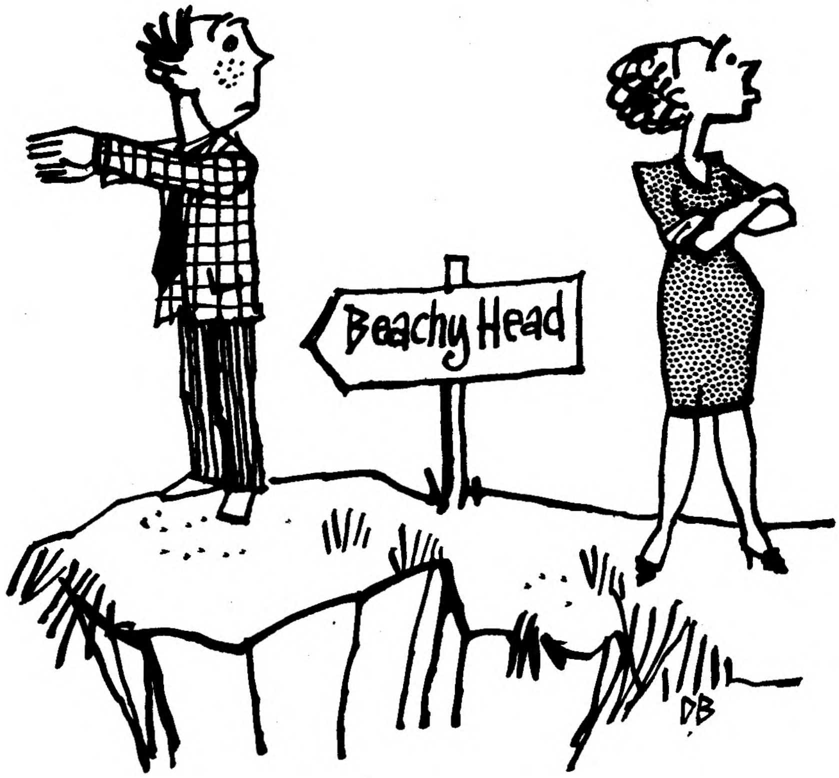
"The promotion and development of awareness" has already proved very rewarding for many teachers. We desperately tried to keep a very low profile until we could prepare enough material and information to provide a worthwhile service for our members, which would be released on 1st January 1982 - but the grape-vine proved too much for us - letters from teachers, desperate for help, poured in. Like it or not we were very soon deep into the awareness and provision of information business. Most of the summer holidays were spent in preparing Information Guides, which are now available to MAPE members free of charge through the Secretary. The 'effective use' is a continuing aim, but two of our Information Guides might help in that they are case studies, based on practising teachers' use of certain programs within their classrooms.

Putting this latter part of the aim into practice is proving to be extremely rewarding from an intellectual point of view. It is a whole new pioneering area of development in which many teachers are involved. MAPE does not want to let 'microelectronics' become a subject within the Primary School curriculum, for we believe that the new technology is so essential that it must be absorbed into the very fabric of Primary/Middle School Education - an essential part of its philosophy and practice. This belief has allowed MAPE to move forward and away from the simple use of the computer as a mere tool for drill and practice - it can be used as such but it has far more potential than that.

We also abhor its being locked only into mathematics and science - its use must be developed across the curriculum, and as a thinking tool. MAPE also believes that it is essential that <u>all</u> children and <u>all</u> teachers should be given the opportunity to use the new technology, so that the divisive situation of creating a 'computer elite' in a society based on Information Technology may be avoided.

To help achieve its aim, MAPE has indeed been fortunate in securing as its House Journal Newman College's excellent magazine and I would like to thank Roger Keeling and the editorial staff at Newman College, as well as the good folk at Heinemann's who have also been very helpful in the venture. It is through MICRO-SCOPE that members and interested spectators can share their ideas and experiences and thereby learn from each other - we urge you to use it for this purpose.

To enable discussion and practical help to be offered at a more local level, it is the intention of MAPE to set up an efficiently organised infra-structure which will allow for really active Area and Regional developments to take place. That, as I see it, will be one of the three major tasks facing MAPE this year; creating an effective



Conditional jump

INSET service with support material and an efficient software service will comprise the other two major areas of development.

Geoffrey Hubbard, Director of CET, in his opening address at the Primary Schools' Microcomputer Conference in December 1981 summarised the problem facing Primary Schools. He said, "I.T.82 has three elements:-

- Information Handling: The storage and retrieval of information.
- Communication Technology: The transmission of information.
- Information Transformation: The manipulation of information.

MAPE exists to help teachers help children to develop all three of these elements as part of their general education within the Primary sector.

Geoffrey Hubbard concluded his address at that same Conference with the words -

> "The Primary School has a reputation for knowing what it is about. To keep that reputation you need to make sure that you take on board the implications of the new technologies. You also need to start shouting about the importance of the Primary School, about the need to have at least the same access to the world of microelectronics as the Secondary Schools............"

MAPE exists to help teachers take on board these implications. As Chairman I ask you to spread the word amongst your staffroom colleagues - so that the voice of MAPE can grow louder - so that the shouting for help and resources can be heard throughout this country.

References

(1) 'Microelectronics: Their Implications for Education and Training.' - Published by CET, 3 Devonshire Street, London. W1 2BA (available free).

(2) 'Microcomputers: Their Uses in Primary Schools.' by R. Jones. Published by CET £6.00.

THE MAPE STEERING COMMITTEE - Contact address list

Derrick Daines: Derrick is a Deputy Headmaster of Carsic Primary School, St. Mary's Road, Sutton-in-Ashfield, Notts. Mansfield 53189. He has been using computers with Juniors since 1965. He is a prolific software writer, author on electronics and on computing, and contributes regularly to Computer Magazines. He is MAPE's hardware specialist and Regional Officer for the Midlands. (East, North and West).

David Ellingham: David is a Headmaster of Marlcliffe C.P. School, Marlcliffe Road, Sheffield S64 4AJ. 0742-344 329. He works not only within his own school on the development of computer literacy and C.A.L. but also on in-service work with Sheffield Primary Heads and senior members of staff. He is an active member of the Sheffield Technology in Education steering committee. He is MAPE'S Regional Officer for Yorkshire and the North East.

James Fawcett: James teaches at St. Malachy's R.C. School, Beaufort Street, Liverpool 8. 051-709 3682. He and his wife bought a PET micro-computer between them which James uses within his school. He has accumulated a great deal of skill as a software developer, as well as a large range of educational software. He is involved not only in INSET for other teachers and interested parents, but also in a Liverpool Microcomputer User Group. He has just completed writing a large administrative program for the Liverpool F.E. Sector. James is MAPE's Regional Officer for the North West.

Pam Fiddy: The Wing, Rosehill House, Lost Withiel, Cornwall, PL22 ODG. Tel. 0208 872 751. Pam has become well known as the champion of Infant school computing as well as for her work as the Primary Schools representative for M.U.S.E. She is currently taking a M.Phil., working closely with the ITMA group at the College of St.Mark and St.John in Plymouth. She has an Apple system as well as her personal Sorcerer. She is MAPE's specialist in Infant School and Pre-School applications and shares the Regional representation for the South West with Tony Mullan.

Roy Garland: Roy is a lecturer at the School of Education, St.Luke's College, Exeter. He describes himself as a keen amateur, using his own Apple system. He is Chairman of Plymouth and District Amateur Computing Club. He is particularly interested in the concept of computer literacy, and is involved in teaching this concept to Primary children. He is currently involved in researching in this area. He is the Conference Co-ordinator for MAPE.

Ron Gatfield: (Treasurer) Ron is Headmaster of Hart Plain Middle School, Hart Plain Avenue, Cowplain, Hants. 070 14 3200. He has his own NASCOM and his school uses two PET micros. He is deeply involved in INSET in the Hants. area and is a member of the Micros in Primary Schools Steering Group set up by the Hants. LEA. Ron is MAPE's Treasurer and Regional Officer for the South Coast.

Ray Haydon: Ray is Primary Adviser for South Humberside, at 43 Heneage Road, Grimsby, S. Humberside. Grimsby 44122. He has been involved in Education Technology for many years, and formed a specialist program design group which has generated a large volume of programs especially suited to the Apple system. He is particularly interested in establishing a 'Rationale' for computing in Primary Schools, and in the design of programs of high quality. It is hoped that he will become MAPE's Regional Officer for Humberside and District.

Barry Holmes: (Secretary) Barry is Headmaster of St. Helens C.P. School, Bluntisham, Cambs. 0487 841 468. He is successfully using an Apple system throughout his school, and has developed some exciting software. He has recently completed an Advanced Diploma Course at Cambridge Institute of Education and specialises in computer applications. He is currently carrying out a research project on the educational potential of the Micro-writer, and its associated developments. He is a member of the Cambs. Software Development Group, and of Houghton Consortium. He is MAPE's hard-working Secretary. He also shares responsibility for the development of the Eastern Region.

Ron Jones: (Chairman) Ron is Headmaster of Upwood C.P. School, Upwood, Cambs. PE17 1QA. 0487 813510. He conducted a National Survey of Primary Schools using microcomputers, and is the author of 'Microcomputer - Their Uses in Primary Schools' published by CET. He is developing the use of a PET computer within his own school, and has been involved in INSET work with many different organisations. He was joint organiser of the Homerton Conference on Microcomputers in March 1981. He is Chairman of the Cambridgeshire Software Development Group, and is also Chairman of MAPE. He shares the responsibility of Regional Officer for the Eastern Counties with his Cambs. colleagues Barry Holmes and Don Walton.

Roger Keeling: Roger, an MSc. in Computer Science, lectures at Newman College, Genners Lane, Bartley Green, Birmingham B37 3MT. 021 476 1181. He originally taught computing at G.C.E. 'O' and 'A' level, but over the past two years has developed an interest in computing in Primary Schools, including the production of software, school based work and INSET courses. He is Regional Officer for the South Midlands.

Tony Mullan: Tony is Headmaster of Plympton St. Maurice C.P. School, Bullers Hill, Plymouth. 0752 337 424. He has been involved in using computers with Primary School aged children since 1975, and is keen to develop software. He is one of MAPE's Regional Officers for the South West.

Dr. Michael Thorne: Mike is a lecturer in the Department of Computing & Mathematics, Senghernydd Road, Cardiff. 022 44211 Ext. 2678. He is working with Dr. David Wharry on the Microcomputer in Primary Schools Education Project based at UCC. He is MAPE's 'non teacher' expert, and is one of the two Regional Officers for Wales.

Don Walton: Don is Deputy Head of Houghton C.P. School, Houghton, Cambs. He has been developing the use of computers in his school for over two years using PETs. He is a prolific software writer, basing all his programs on practical use within the classroom. He is leader of the Houghton Consortium, responsible for the design and production of programs for use in Primary Schools. He has INSET responsibilities for a wide area and is one of MAPE's Regional Officers for the Eastern Region.

Bryan Weaver: (Deputy Chairman) Room 231C, County Hall, London SE1 7PB. 01 633 6417. Bryan is an ILEA Inspector for Computing within Secondary and Primary sectors of Education. He works very closely with the Primary School Inspectorate Team. He has responsibilities for school based developments as well as INSET courses. He is Deputy Chairman of MAPE and Regional Officer for London and the Home Counties.

Dr. David Wharry: David is working with Mike Thorne on the Microcomputers in Primary Education Project. He is Primary PCCE tutor for Science based at the Dept. of Education, University College, P.O. Box 78, Cardiff. 0222 94211. He is Secretary of the Computing Section of Science, Mathematics and Technology Centre, UCC. He is involved in educational computing courses for pre-service teachers. He is one of MAPE's Regional Officers for Wales.

Russell Wills: is a lecturer at Dundee College of Education, Gardyne Road, Broughton Ferry, Dundee. DD5 1NY., and is MAPE's most northern Regional Officer. He is a lecturer in the Computer Education Department of the Dundee College of Education. He is a prolific software writer, especially for the PET Computer. His enthusiasm for the use of computers in Primary Schools is infectious, and has led to many converts within his sphere of influence.

SIMULATIONS - The creative use of resources

Since the late 70's there has been an increasing number of primary schools involved in computing and C.A.L. Inevitably, as with any new development, we have all trodden similar paths - creating 'spelling' programs and 'maths skills' packages as we learn how to handle the various routines available on the machine. All too often this has meant that attention has become focussed on the facilities provided by the computer rather than on our educational goals and how we can use computers to serve these. At worst the programs merely practise a skill with little or no attempt to assist the learner. Many have some form of reward for correct responses and one of the worst I have seen simply states 'Better luck next time' if the answer is incorrect!

This is not to say that 'skills' programs do not have a place in the pedagogy of C.A.L. but rather that such practice should not assume a major proportion of the work. If this became the case then we believe the computer would become a second generation "teaching machine" and end up unused in the stock cupboard. Further, many teachers' complain that using the machines in this way is doing no more than they can already do with a piece of paper and pencil, at far less cost - a justifiable comment in the current economic climate.

How can computers be used to enhance the work of the teacher or provide an additional facility which otherwise would not be available, and thus justify their expense? It is this question that should now be the major consideration of those developing the work in this field. There are, we believe, several areas worthy of consideration, including information retrieval, logo and turtle (or Bigtrak) and simulations. It is the last of these in which we are the most interested at the moment.

Simulations by their very nature depend upon developing concepts and understanding. They may well involve the use of "skills" but these are practised in a meaningful situation rather than in isolation. The rationale behind such programs is based on the theories of Piaget and Bruner. These programs can, in our view, enhance the work already done in the classroom rather than merely support it. In the example programs cited below it will be seen that the computer plays only an organisational or management role and that the work undertaken by the children away from it is by far the most important aspect. Typically, children may be expected to record details, discuss and make decisions, produce 'creative reports' or diaries. The direction of the work is managed as a partnership between the machine and the teacher, each with a role to play in the learning situation. It is important to realise that these simulations are not aimed at giving children an insight into the way in which, for example, 'pirates' or 'archaeologists' think but rather to practise decision-making related to a particular activity.

In our first example 'Treasure Islands' the children are divided into two groups of four. One, the Hispaniola Crew, must collect treasure from any three or four ports and then sail off the map. The second crew, the pirates, have to devise a search strategy to capture the 'Hispaniola' in the open sea. A variety of hazards may be introduced to increase the game's complexity when the children have become familiar with the rules of the standard game. Information on the opposition may be obtained when visiting port and when the ships are within sighting distance.

In 'Treasure Islands' the crew must make the decisions based on the information available. On one occasion a child asked::"What did we do wrong?" when, at the end of the game, they had failed to capture the treasure ship. The reply was "Nothing - you made the decisions based on theinformation you had." It is important for children to realise that, in life, we make decisions based on information which is often incomplete. The most important feature of this simulation is the group discussion which takes place away from the computer, actually planning moves and strategies. The computer affords the teacher the opportunity to allow groups to discuss a problem, to reach decisions and see the consequences of these decisions in a safe environment without interference of an adult.

In the second example 'Saqqara', this work away from the computer again assumes the major proportion of the activities in which the children are involved. This project is based upon an actual archaeological site in Egypt. Its data attempt to be as faithful to the actual place as the constraints of the computer and the age of the children allow. The necropolis of Saqqara is one the richest and most varied sites in Egypt and contains as its most famous feature the Step Pyramid of Zoser, which is the oldest stone building in the world. Naturally, with its bases in historical facts, there is a fund of reference material available for use in the classroom. The children are required to use reference books throughout the project,which lasts for a number of weeks. The way in which books are used is important. Principally, the children are looking for information about what they have found during the simulation. They have been given fairly specific reference goals - not with a formal question on the screen - but with an archaeological find. The 'question' is formulated by the children in an attempt to satisfy their curiosity and their desire to function more effectively in ensuing sessions.

Historical knowledge begins with historical artefacts - not with books. It is not confined by curriculum requirements - but is in fact a web of informed guesses. Each new discovery can shed new light upon history. The program attempts to foster this concept of historical knowledge.

Archaeology is not "treasure hunting". It is a systematic, methodical enterprise requiring record keeping and mathematical exactitude. The children are required to map the areas surveyed on the surface and to create diagrams which will give three dimensional representation of the tombs as they excavate them. Failure to do so adequately results in extra expense and frustration. Groups soon learn that they must be ordered in their record keeping - because their effectiveness is significantly impaired if they are not. One of the constraints present in any activity of this nature is financial and in the project, not only do letters have to be written for grants, but the money once acquired has to be spent wisely. However wisely financial affairs are managed, generators develop faults and land rovers break down - as indeed they do in reality.

In addition to all this record-keeping, reference work, drawing and map-making, the children write a day-by-day account of their lives in Egypt until such time as they fly back to the cold and the rain of England, by which time each child has a substantial project booklet. The program can be linked with a larger class project on Egypt. The mathematical components can be isolated by the teacher and dealt with in whatever way he feels most appropriate to his class, mathematics scheme or teaching style.

It is quite unrealistic to expect a hard-working class teacher to adopt this kind of approach with a number of different groups of children exploring different sites in different ways without a computer. This is where the computer really comes into its own - leaving the teacher to assist, discuss, advise - in a creative and dynamic sense.

The computer can be seen not only as an organising machine but as a springboard. It is something to which a number of paths lead and from which others branch out to new horizons.

Barry Holmes & Ian Whittington, Cambridgeshire.

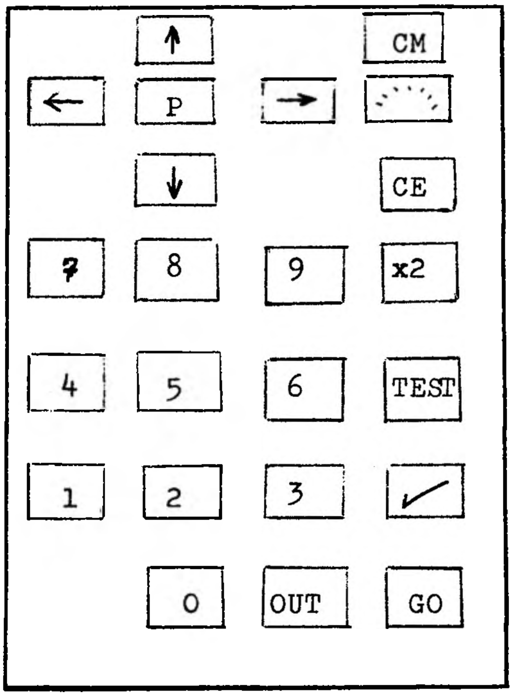
BIGTRAK in Wales

> Mike Thorn gave a challenging session at the 1981 Exeter Conference with a demonstration of BIGTRAK. He will be at Exeter again in April. The ideas he proposes here are taken up in the second article, a teacher's report on using BIGTRAK with infants.

1. "THE POOR MAN'S TURTLE"

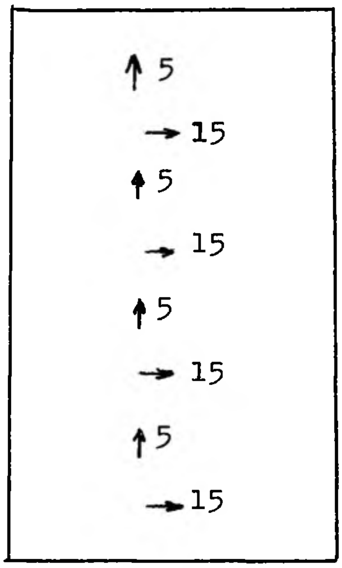
BIGTRAK is a computer-controlled toy tank made by Milton Bradley of Newport in Gwent, South Wales. It can be obtained from W. H. Smith for about £30 and from Argos Stores for slightly less. Without doubt it was the toy of 1981 and may well retain the accolade for 1982. As a result of reports of work done with it in South Wales schools, enquiries have come from as far away as Taiwan.

On the back of BIGTRAK is a keypad similar to that of a modern electronic calculator. Giving an instruction to BIGTRAK consists of pressing a button describing an action and then pressing the numerical keys to say how much. For example, the sequence ↑5 would make BIGTRAK go forward five times its own length. Similarly ↓6 would make it go backwards, six times its own length. ← and → denote turning to the left and to the right respectively. Specifying how much to turn is done by imitating the hands of a clock:



Thus turning 90° to the left ←15 and turning right to face the direction you've just come from is →30.

Putting these ideas together, a BIGTRAK program to trace out a square of side 5 times the length of the BIGTRAK vehicle would be:



If this looks familiar to anyone who knows Turtle Graphics on the Apple computer or the LOGO programming language that is because BIGTRAK instructions are a small subset of LOGO. Thus time spent playing with BIGTRAK is time spent learning part of a real live computer language. So there's one fundamental advantage of BIGTRAK already: Computer Studies without tears. Better still, 4 and 5 year olds love it. (so do grown-ups when they can get near enough to have a go).

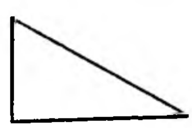
My five year old son will happily play his part in family therapy when I ask him to make BIGTRAK go from the living room to the kitchen and shoot mummy six times with a photon gun. Never mind the difficult concept of angle. He wanted the toy to go somewhere and discovered how to get it there by trial and error.

Thanks to the generosity of the BIGTRAK manufacturer, ten toys are going round South Wales schools in a project now beihg run by

Dr. David Wharry of the Department of Education, University College, Cardiff, with funds from the Department of Industry. David is keeping a log book of the uses to which BIGTRAK has been put. Some teachers have used it for computer studies. One used the fact that ← 15 followed by → 15 does not bring you exactly back to where you started on certain floor surfaces to introduce the children to friction. BIGTRAK, the teacher and the whole class toured the school looking for different floor surfaces. Some teachers have concentrated on developing the estimation skills necessary to get BIGTRAK to follow a route without measuring. Others have concentrated on the measuring possibilities.

For me BIGTRAK is the poor man's Turtle (see "Mindstorms" by Seymour Papert, Harvester Press*) since, to echo Papert, BIGTRAK offers:-

* a domain over which the children have control;
* a world in which they can lose themselves in the practice of science;
* a domain in which they can decide what to do (after all if they get it to go round

  they must be getting an appreciation of Pythagoras' Theorem);
* if, for example, distances are only ever estimated we have a domain in which the teacher doesn't know the answer but can help the children debug their own thought processes, and also (and perhaps most important of all);
* a domain in which getting it wrong is expected.

(Footnote) * See review on Page 19

Why not give it a try in your school? At £30 how can the PTA refuse? Don't forget to ask them to buy the batteries as well. A good quality set will last a couple of months. If you really can't afford to buy a BIGTRAK ask your class. Probably several of the children already have one.

Dr. Michael Thorne, Mathematics Institute
University College, Cardiff.

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2. BIGTRAK ON THE MOVE!

Contrary to the Victorian maxim that they should be seen and not heard, little children need to voice their ideas. They need to talk through their problems and expand their vocabularies. This exercise is essential if they are to emerge as clear-thinking articulate adults in a world increasingly dominated by pre-digested literature ladled out in cartoon form from books and TV screens.

They therefore need to listen and deliberate rather than just hear, in order to communicate effectively and happily. This art of listening is not innate in a young child. The efficiency of listening varies directly with the power of concentration. Special attention must be given to the development of this facility of concentration especially at the present time when we find ourselves exposed to the continuous buffeting of noises. These assault our hearing and consequently cloud our thinking processes.

Noises are contrasted with speech as experienced in a class-room. Careful organisation of conversation can encourage a child to:

listen to an idea;

evaluate that idea;

comment or act on that idea;

comment critically on the outcome of that action.

The net result is a reciprocation of respect between speakers and listeners. This is one way in which the school builds upon the elements of speech provided initially by the home. Further en-richment is achieved by the broadening of experience.

Another way is by encouraging communication by way of the interactive medium of toys and other representational materials. There still exists an important place for "make-believe" in the life of a child. The atmosphere and excitement generated by modern scientific and technological developments has its effect upon the interest and curiosity of young children. An example is the recent U.S. space-shuttle flights. BIGTRAK represents a step in helping teachers to fulfil this need. Some adults may view it as just a toy but it provides excellent preparation for hands-on experience with microcomputers. It also develops hand-eye co-ordination. Observation of the results of one's action leads on both to critical evaluation of such results and to anticipating the results of the next purposeful operation of the keys.

Learning should be an enjoyable experience and not confined to skill and drill routines. BIGTRAK provides for freedom of activity and imagination leading to execution of more formally outlined tasks. Some children display a strong aversion (maybe through fear or lack of confidence) to formal classroom situations. By tackling carefully graded, thought provoking problems, they meet mathematical concepts in a meaningful way, and become motivated through the satisfaction of achievement. Many begin by watching other children (older and more experienced). In this context, the older ones are between six and seven years of age! The progression is then by way of making suggestions to "having a go" on their own. Usually the biggest problem is having patience to await one's turn!

These activities encourage the development of communicative skills, observation and recall - not to mention acceptable social behaviour! The teacher's role is minimal. Having initiated the session she acts as a point of reference for results. The teacher is then able to give more attention to other work in progress in the class. Observation has been enhanced by the use of a tape recorder to listen to the children talking. In their eagerness they often "talk through" the results of their keying activities. It has also shown their reaction to the non-compliance of the machine to their wishes. They have come to learn that most important of lessons - that it will only do what it has been told to do.

De-bugging

The keyboard is easily manipulated by small hands, the numbers are clear and codes like CM are easily remembered. Some children like to use the manual to help them. It gives them a greater feeling of independence whilst satisfying a desire to read.

BIGTRAK was used by small groups. As new children were introduced to this activity the older ones were required to instruct the younger. In this way one could discover whether a child understood the operational sequences and limitations of the machine. A group would have about 45 minutes in a week mostly working unaided following a short time with the class teacher. The group was separated from the rest of the class to avoid disturbances and to give them the greater space afforded by the School Hall. The children were encouraged to draw a preliminary scheme and then report their results in a way appropriate to their communicative skills. Some would write, some draw and some talk.

Some of the directed activities involved marking a route with suitable objects of string and blutack. The children had to convert that route into a set of instructions and test them. Another activity involved the specification of the route in words for the children to convert to string and BIGTRAK. These practical sessions gave the children confidence in attempting unknown sequences. They were ready to comment. The individuals reacted in their different ways. I would plan the route and say very little but was able to record a diagram. M who is not as mature or confident, talked a great deal: "Yes, Justin, it is ten lengths, now turn to quarter past. Down to the next post. Now six flashes ..... Please, Miss, it has done it right. Can I have a try now, please?"

This school has three infants' classes of 31 pupils in each. In all, some 50 or so children were involved in this evaluation between June and December, 1981. When BIGTRAK was moved to another school they insisted it should come back soon.

Ruth Russell,
Swiss Valley County Primary School,
Llanelli.

"MINDSTORMS - CHILDREN, COMPUTERS AND POWERFUL IDEAS"

by Seymour Papert, Professor of Maths at M.I.T. (Harvester Press, 1980: £9.95)

There is little prospect that this beautiful, disturbing book will become a seminal influence on educational developments. A more likely fate for Papert is to follow his great mentor, who has become 'a Piaget backward' - "Educators distort Piaget's message by seeing his contribution as revealing that children hold false beliefs, which they, the educators, must overcome .... thereby rejecting the way children really learn."

The critique of schools is painfully barbed. Papert sees the mathematics curriculum as rooted in outdated arithmetic skills and in what was learnable and teachable with the primitive technology of pencil and paper. 'New Math' is a trivialisation of mathematicians' mathematics: "Like clothing passed down to younger siblings, it never fits comfortably." In rote learning, "material is treated as meaningless." The social construction of the individual is as a bundle of attitudes. When objective tests "prove" that some children cannot do arithmetic, it is "like proving that deaf children cannot have language because they don't hear."

At a deeper level, Papert is out to challenge our conception that computers should serve the present school system and syllabus. "My image of a child's relationship with a computer ... goes in the opposite direction. In many schools, the computer is being used to program the child. In my vision, the child programs the computer and acquires a sense of mystery." This vision is central, of the child as epistemologist, consciously constructing a cognitive style out of purposeful, confident investigation. "The effect of work with Turtle geometry ... is primarily <u>relational</u> or <u>affective</u>." The child can "play Turtle" because, like himself (but unlike Euclid's point), it has <u>heading</u> as well as position. He uses the "object-to-think-with" to meet a few powerful theorems, lifetime "tools-to-think-with". "The most powerful idea of all is the idea of powerful ideas." Papert's phrase "computer as pencil", dramatically opposed to "computer as teaching instrument", evokes his image of future children with a sense of "owning" dynamics - no longer passive receivers of TV animations and alien technology.

The dialectic of thought and language is a key theme - hence Papert's phrase "the LOGO environment." "The name LOGO was chosen for the new language to suggest that it is primarily symbolic and only secondarily quantitative ... Our movement ... sees programming languages as heavily invested with epistemological and aesthetic commitments." Using BASIC is compared to introducing poetry through pidgin English! When pupils learn programming, they enter into intellectual collaboration with teachers, as new situations occur and the child learns "by doing what teacher <u>does</u>."

This inspirational book is full of lively anecdotes and unexpected applications ... to the learning of juggling, skiing, cycling and the samba as well as to mathematics, physics and aesthetics! His work reflects diverse influences: Piaget; Dewey; Illich and Holt; Bruner and Dienes; the Bourbaki; Lévi-Strauss and the Structuralists. English ecleticism tends to distrust such a consistently theoretical world-view, but Papert's passionate humanism and affective insight will win the respect of many readers. As an educational utopian, he dares to speculate on new horizons for learning and new human relationships in the computer culture of the near future.

John Lane.

PROGRAM LISTING: "DIAGRAMH"

This program illustrates very well the advantages of using high resolution graphics. An earlier version, written in low resolution graphics, was very limited and produced an unsatisfactory display.

Imagine the screen covered by a grid of invisible vertical and horizontal lines. The technique of graphics involves selecting and shading sets of unit squares on this grid. On the 380Z, low resolution graphics uses a grid measuring 80 x 60 units, so the unit square is quite large and clumsy - a diagonal line shows a marked stepped effect. The unit square for high resolution graphics has only one twelfth of the area, on a 320 x 192 grid, and so finer lines can be drawn and the stepped effect is unobtrusive.

The new program is designed for use by upper juniors as a means of providing reinforcement on angles, bearings and relative distances. The pupil can create images on the screen through the application of these concepts. The first example shows how to draw a square (user input underlined). What shape is drawn in example 2?

```
Command (H for HELP) N
Length of line? 40
Command (H for HELP) E
Length of line? 40
Command (H for HELP) S
Length of line? 40
Command (H for HELP) W
Length of line? 40
Command (H for HELP) END
```

```
Command (H for HELP) S54E
Length of line? 30
Command (H for HELP) S18W
Length of line? 30
Command (H for HELP) W
Length of line? 30
Command (H for HELP) N18W
Length of line? 30
Command (H for HELP) N54E
Length of line? 30
Command (H for HELP) END
```

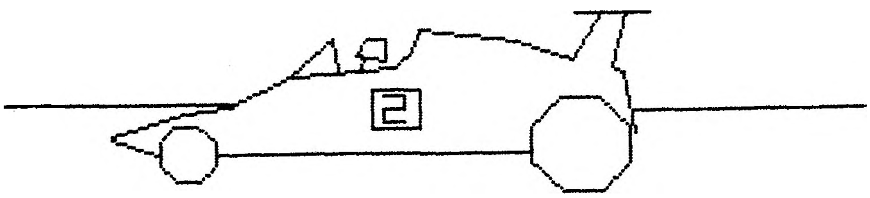
The full menu, given below, can be called from the program by typing H (for help). Note that directions must be 3-figure bearings or conventional compass directions. Input that is not in the correct format eg. W37N will be detected and the pupil asked to repeat that stage.

```
Command (H for HELP) H
Commands available ...

'L'      changes line colour
'J'      jumps 10 in current direction
'CL'     clears the screen
'C'      centres the cursor
'F'      flashes the cursor
'ER'     erases the last line drawn, and
         can be used repeatedly
'SX'     reflects the picture in x-axis
'SY'     reflects the picture in y-axis
'R'      redraws the picture from scratch
'AX'     draws or erases axes
'SAVE'   saves the picture on disk
'LOAD'   loads a previously saved picture
'END'    ends the program

Also, typing a direction (example W or
S21E or 221 or 010) will move you in
that direction.
```

Most of the commands are self-explanatory. Lines can be drawn in white or black (background colour - this is used for erasing) and switching between the two is achieved by typing L. To clear a picture type CL or to centre the cursor type C. If you lose track of your position on the screen, typing F will reveal the current position of the cursor. To erase the last line drawn type ER; repeated use of ER will delete previously drawn lines. The jump command is useful for crossing a white line with a black line without leaving a 'black hole' in it. Using these commands it is possible to create quite imaginative creations, as illustrated below.



The program also handles reflections. Imagine two axes through the centre of the screen - a horizontal line or x - axis and a vertical y - axis. Typing AX draws these lines on the screen; repeating AX deletes them. The command SX creates a copy of the picture after reflection in the x - axis.

In a lesson on ideas of symmetry, it may be useful to save time by using shapes prepared beforehand. The command SAVE can be used to store pictures on a disc. At any subsequent point in time you can LOAD the particular shape, and it is immediately displayed on the screen. By this means you could rapidly examine the symmetries of all the letters of the alphabet.

Of course, you could do that with a mirror, but an imaginative teacher can pose more challenging problems using the power of symmetry. For example, write an efficient set of instructions to draw: a) an equilateral triangle; b) an isosceles triangle; iii) a rhombus; iv) a kite. Which needs fewest instructions? Repeat this exercise for a regular hexagon and regular octagon. Here are two ways of drawing the octagon:

```
Command (H for HELP) L
Command (H for HELP) N
Length of line? 36
Command (H for HELP) L
Command (H for HELP) E
Length of line? 15
Command (H for HELP) S45E
Length of line? 30
Command (H for HELP) S
Length of line? 15
Command (H for HELP) SX
Command (H for HELP) SY
Command (H for HELP) END
```

```
Command (H for HELP) L
Command (H for HELP) N
Length of line? 52
Command (H for HELP) L
Command (H for HELP) S67.5E
Length of line? 40
Command (H for HELP) S22.5E
Length of line? 40
Command (H for HELP) SX
Command (H for HELP) SY
Command (H for HELP) END
```

The program also offers practice in converting between the two modes of giving a bearing. The two examples below produce identical squares. Redraw the pentagon of example 2 using 3-figure bearings.

```
Command (H for HELP) N
Length of line? 40
Command (H for HELP) E
Length of line? 40
Command (H for HELP) S
Length of line? 40
Command (H for HELP) W
Length of line? 40
Command (H for HELP) END
```

```
Command (H for HELP) 000
Length of line? 40
Command (H for HELP) 090
Length of line? 40
Command (H for HELP) 180
Length of line? 40
Command (H for HELP) 270
Length of line? 40
Command (H for HELP) END
```

In fact these ideas can be extended to consider the number of different ways there are of producing a particular shape. The examples below, for example, all produce the same rhombus.

```
Command (H for HELP) L
Command (H for HELP) N
Length of line? 43
Command (H for HELP) L
Command (H for HELP) S30E
Length of line? 50
Command (H for HELP) S30W
Length of line? 50
Command (H for HELP) N30W
Length of line? 50
Command (H for HELP) N30E
Length of line? 50
Command (H for HELP) END
```

rhombus 1

```
Command (H for HELP) L
Command (H for HELP) N
Length of line? 43
Command (H for HELP) L
Command (H for HELP) 150
Length of line? 50
Command (H for HELP) 210
Length of line? 50
Command (H for HELP) 330
Length of line? 50
Command (H for HELP) 030
Length of line? 50
Command (H for HELP) END
```

rhombus 2

```
Command (H for HELP) L
Command (H for HELP) E
Length of line? 25
Command (H for HELP) L
Command (H for HELP) 330
Length of line? 50
Command (H for HELP) 210
Length of line? 50
Command (H for HELP) SX
Command (H for HELP) END
```

rhombus 3

```
Command (H for HELP) L
Command (H for HELP) N
Length of line? 43
Command (H for HELP) L
Command (H for HELP) S30W
Length of line? 50
Command (H for HELP) S30E
Length of line? 50
Command (H for HELP) SY
Command (H for HELP) END
```

rhombus 4

```
Command (H for HELP) L
Command (H for HELP) N
Length of line? 43
Command (H for HELP) L
Command (H for HELP) S30E
Length of line? 50
Command (H for HELP) SX
Command (H for HELP) SY
Command (H for HELP) END
```

rhombus 5

There are many geometrical applications. What happens, for example, if a shape is repeated with all line lengths doubled? Here the programs

serves to reinforce concepts of scale through comparisons of angles, lengths and areas. Commutativity is another aspect that can be investigated. Does a move followed by a reflection give the same picture as a reflection followed by a move? The program could also be used to introduce vectors.
Study the resultant in the following two examples.

```
Command (H for HELP) S              Command (H for HELP) N60W
Length of line? 10                  Length of line? 20
Command (H for HELP) N60W           Command (H for HELP) S
Length of line? 20                  Length of line? 10
Command (H for HELP) END            Command (H for HELP) END
```

In writing an article of this type, I am forced to sit down and think seriously about the applications of the program, and in turn this leads to the recognition of its limitations and shortcomings. When I wrote the first sentence I thought the program was finished, complete, bug-proof, flexible, perfect .... As the article progressed gaps appeared .... so, back to the drawing board! The latest news is that the program listing now includes ROTate and SCALE. "ROT45" rotates the picture clockwise about the centre of the screen by 45 degrees (a negative input here gives an anticlockwise rotation). After the rotation, both the original and rotated pictures are displayed. Typing R will redraw only the rotated picture, erasing the original. The same applies to SCALE, where a scale factor larger than 1 will enlarge the diagram and a factor between 0 and 1 will reduce it. Note that for large scaling factors the diagram will overspill the screen onto the 'virtual' screen (-32767 to+32767 in both directions).

STOP PRESS Help! Somebody has just mentioned the possibility of being able to move the position of the axes and to rotate about any point. Pen down quick and get this handed in to the editor.

R. Keeling

```
10 REM ****************
20 REM * DIAGRAMH      *
30 REM * VER. 2.1      *
40 REM * HI-RES        *
50 REM * N. OSBORNE    *
60 REM *NEWMAN COLLEGE*
70 REM * FEB 1982      *
80 REM ****************
90 REM
100 REM INITIALIZE MODE,VARIABLES ETC****
110 CLEAR 200:PUT12
120 PI=3.1415927
130 CALL"RESOLUTION",0,2
140 GRAPH
150 A$=""
160 DIM P(1500)
170 SP=0
180 LX=159:LY=95:X=LX:Y=LY:LC=3:CD=-1
190 CALL "PLOT",X,Y,LC
195 REM INPUT COMMAND
200 PLOT79,0,CHR$(66-(LC=3)*21):INPUTLINE"Command (H for H
ELP) ",P$
210 IF P$="" THEN 260
220 A$=""
230 FOR K=1 TO LEN(P$)
240 U=ASC(MID$(P$,K,1)):IFU>90 THEN U=U-32
250 A$=A$+CHR$(U):NEXT
260 IFA$="END"THEN1500
270 IFA$="L"THENLC=3-LC:P(SP)=-2:SP=SP+1:GOTO200
280 B=VAL(A$)
290 IFB>0 AND LEN(A$)=3 THEN630
300 IFA$="000"THEN630
310 IF A$="SY" OR A$="SX" THEN 1510
320 IF A$="H" THEN 1680
330 IF A$="W"THENB=270:GOTO630
340 IF A$="E"THENB=90:GOTO630
350 IF A$="ER"THEN780
360 IF A$="CL"THEN900
370 IF A$="R"THEN960
380 IF A$="J"THEN1980
390 IF A$="F"THEN1460
400 IF A$="C" THEN P(SP)=-3:SP=SP+1:X=159:Y=95:GOTO 190
410 IF A$="AX" THEN GOSUB 1920:GOTO 190
420 IF A$="SAVE" THEN 1180
440 IF A$="SCALE" THEN 2180
450 IF A$="ROT" THEN 2310
460 L$=LEFT$(A$,1):IFL$="N"ORL$="S"THEN500
470 IF A$="LOAD" THEN 1310
480 ?"Invalid command":GOTO200
490 REM CONVERT DIRECTION TO BEARING ***
500 IFA$="N"THENB=0:GOTO630
510 IFA$="S"THENB=180:GOTO630
520 AA$=MID$(A$,2)
530 D=VAL(AA$):IFD<361THENGOTO550
540 ?"There are only 360 degrees in a circle":GOTO200
550 IFD=0ANDLEFT$(A$,1)<>"0"THEN480
560 R$=RIGHT$(A$,1)
570 IFL$="S"ANDR$="W"THENB=180+D
580 IFL$="S"ANDR$="E"THENB=540-D
590 IFL$="N"ANDR$="W"THENB=360-D
600 IFL$="N"ANDR$="E"THENB=D
610 IFB>360THENB=B-360
620 IFR$<>"W"ANDR$<>"E"THEN480
630 B=B*3.1415927/180
640 IF B>=2*PI THEN B=B-2*PI:GOTO 640
650 LX=X:LY=Y
660 INPUT"Length of line";L$
670 IFVAL(L$)=0ANDL$<>"0"THEN?"Must be a number":GOTO660
680 L=VAL(L$)
690 IF L=-4 OR L=-2 OR L=-3  THEN ?"Not allowed, I'm afrai
d":GOTO660
700 PX=X+SIN(B)*L+.5:PY=Y+COS(B)*L+.5
710 IFPX>0ANDPX<320ANDPY>0ANDPY<190THEN730
720 PRINT"This would take you off the screen":GOTO 200
730 X=INT(PX):Y=INT(PY)
740 CALL "LINE",X,Y,LC
750 P(SP)=B:P(SP+1)=L:SP=SP+2
760 CD=B
770 GOTO 190
775 REM ERASE LAST LINE
780 IF SP=0 THEN?"Not possible...":GOTO200
790 N=P(SP-1):IFN=-2OR N=-3 OR N=-4 THEN?"Not possible..."
:GOTO200
800 IF N=-2 THEN SP=SP-1:LC=3-LC
810 SP=SP-2
820 B=P(SP):L=P(SP+1)
830 TX=X:TY=Y
840 X=X-SIN(B)*L+.5:Y=Y-COS(B)*L+.5
850 CALL"PLOT",X,Y,0
860 CALL"LINE",TX,TY
870 CALL"PLOT",X,Y,LC
880 X=INT(X):Y=INT(Y)
890 GOTO 200
895 REM CLEAR COMMAND
900 PUT12:?"This will clear your picture."
910 ?"Are you sure ? (Y/N)  ";
920 UU=GET():IFUU>90THEN UU=UU-32
930 IF UU=89 THEN ?:GOTO940 ELSE IFUU=78 THEN ?:GOTO 200 E
LSE 920
940 SP=0:AF=-1:CD=-1
950 CALL"RESOLUTION",0,2:GOTO 180
955 REM REDRAW PICTURE
960 GOSUB 970:GOTO 1460
970 NN=0:NS=0
980 CALL"RESOLUTION",0,2
990 TS=0
1000 CALL"OFFSET",NN,NS
1010 X=159:Y=95:LX=X:LY=Y:LC=3
1020 CALL "PLOT",X,Y,3
1030 IF TS=SP THEN ON ERROR:RETURN
1040 N=P(TS)
1050 IFN=-2THENLC=3-LC:TS=TS+1:GOTO1030
1060 IF N<>-3 THEN 1080
1070 TS=TS+1:X=159:Y=95:CALL"PLOT",X,Y:GOTO1030
1080 IF N<>-4 THEN 1130
1090 TS=TS+3
1100 D=P(TS-2)
1110 X=INT(X+SIN(LD)*D+.5):Y=INT(Y+COS(LD)*D+.5)
1120 CALL"PLOT",X,Y,-1:CALL"PLOT",X,Y,-1:GOTO 1030
1130 TS=TS+2:L=P(TS-1)
1140 X=X+SIN(N)*L+.5:Y=Y+COS(N)*L+.5
1150 X=INT(X):Y=INT(Y)
1160 LD=N
1170 CALL "LINE",X,Y,LC:GOTO1030
1175 REM SAVE PICTURE
1180 PRINT"This command saves your picture"
1190 INPUT "What filename";AA$
1200 ONERRORGOTO1490
1210 IF LOOKUP(AA$)THEN?"File already exists....":GOTO1190
1220 CREATE£10,AA$
1230 PRINT£10,SP
1240 FORK=0TOSP
1250 PRINT£10,P(K)
1260 NEXT
1270 CLOSE£10
1280 ON ERROR
1290 ?"Saving complete."
1300 GOTO 200
1305 REM LOAD PICTURE
1310 ?"This command loads in a new picture"
1320 PRINT"Are you sure (Y/N) ?   ";
1330 UU=GET():UU=UU+32*(UU>95):IF UU=78 THEN PRINT:GOTO 20
0 ELSE IF UU<>89 THEN 1330
1340 ONERRORGOTO1490
1350 PRINT:INPUT"Filename";AA$
1360 IFLOOKUP(AA$)=0THEN?"Sorry, file doesn't exist":GOTO2
00
1370 ON ERROR
1380 OPEN£10,AA$
1390 INPUT£10,K
1400 FORL=0TOK
1410 SP=L
1420 INPUT£10,P(SP)
1430 NEXT
1440 GOSUB 970
1450 GOTO200
1455 REM FLASH CURSOR
1460 FORK=1TO40
1470 CALL"FILL",X-2,Y-2,X+2,Y+2,-3
1480 NEXT:GOTO200
1490 ?"Invalid file name or full disc":GOTO200
1500 TEXT:CALL"RESOLUTION",0,2:END
1505 REM SYMMETRY
1510 IF A$="SX" THEN SM=1 ELSE SM=0
1520 P(SP)=-3:SP=SP+1
1530 TS=0
```

```
1540 T2=SP-2
1550 IF TS>T2 THEN 960
1560 N=P(TS)
1570 IF N<>-4 THEN 1590
1580 FOR K=1 TO 3:P(SP)=P(TS):TS=TS+1:SP=SP+1:NEXT:GOTO 15
50
1590 IF N<0  AND N>-5 THEN P(SP)=N:SP=SP+1:TS=TS+1:GOTO 15
50
1600 B=N:TS=TS+1:SP=SP+1
1610 L=P(TS):P(SP)=L
1620 TS=TS+1:SP=SP+1
1630 IF SM=0 THEN B=2*PI-B
1640 IF SM=1 THEN B=3*PI-B
1650 IF B>=2*PI THEN B=B-2*PI
1660 P(SP-2)=B
1670 GOTO 1550
1675 REM HELP !!!!!
1680 TEXT:PUT12
1690 CALL"COLOUR",3,0:CALL"COLOUR",2,0
1700 ?"Commands available ..."
1710 ?:?"'L'     changes line colour"
1720 ?"'J'    jumps 10 in current direction"
1730 ?"'CL'   clears the screen"
1740 ?"'C'    centres the cursor"
1750 ?"'F'    flashes the cursor"
1760 ?"'ER'   erases the last line drawn, and "
1770 ?"       can be used repeatedly"
1780 ?"'SX'   reflects the picture in x-axis"
1790 ?"'SY'   reflects the picture in y-axis"
1800 ?"'R'    redraws the picture from scratch"
1810 ?"'AX'   draws or erases axes"
1820 ?"'SAVE' saves the picture on disk"
1830 ?"'LOAD' loads a previously saved picture"
1840 ?"'END'  ends the program"
1850 ?"'SCALE' enlarges or reduces picture"
1860 ?"'ROT'  rotates picture":?
1890 ?:?"Press space bar to continue ";
1900 W4=GET():GRAPH:PUT12
1910 CALL"COLOUR",2,128:CALL"COLOUR",3,255:GOTO 180
1920 REM AXES
1930 CALL"PLOT",0,95,-2
1940 CALL"LINE",320,95
1950 CALL"PLOT",160,0
1960 CALL"LINE",160,191
1970 RETURN
1975 REM JUMP 10 UNITS
1980 IF CD<0 THEN ?"Sorry, not possible.":GOTO 200
1990 PX=X+SIN(CD)*10+.5:PY=Y+COS(CD)*10+.5
2000 IF PX<0 OR PX>319 OR PY<0 OR PY>191 THEN 2040
2010 X=INT(PX):Y=INT(PY)
2020 P(SP)=-4:P(SP+1)=10:P(SP+2)=-4
2030 SP=SP+3
2040 CALL"PLOT",X,Y,-1:CALL"PLOT",X,Y,-1
2050 FOR K=1 TO 4
2060 CALL"FILL",X-2,Y-2,X+2,Y+2,-3
2070 UU=GET(5)
2080 NEXT
2090 GOTO 200
2170 REM ** SCALE **
2180 INPUTLINE"Scaling factor";D$
2190 IF VAL(D$)<0 OR D$="0"THEN ?"Must be positive":GOTO 2
180
2200 IF VAL(D$)=0 THEN ?"Input a number please":GOTO 2180
2210 SF=VAL(D$)
2215 ON ERROR GOTO 3000
2220 TS=0
2230 IF TS>SP THEN NS=0:NN=0:GOSUB 990:GOTO 200
2240 N=P(TS)
2250 IF N<>-4 THEN 2270
2260 TS=TS+3:P(TS-2)=P(TS-2)*SF:GOTO 2230
2270 IF N>-4 AND N<0 THEN TS=TS+1:GOTO 2230
2280 TS=TS+2:P(TS-1)=SF*P(TS-1)
2290 GOTO 2230
2300 REM ** ROTATE **
2310 INPUTLINE"Rotate how many degrees clockwise";D$
2320 TH=VAL(D$)
2330 IF TH=0 AND D$<>"0" THEN ?"Input a number please":GOT
O 2310
2340 TH=TH*3.14159/180
2350 TS=0
2360 IF TS>SP THEN NN=0:NS=0:GOSUB 990:GOTO 200
2370 N=P(TS)
2380 IF N=-4 THEN TS=TS+3:GOTO 2360
2390 IF N=-2 OR N=-3 THEN TS=TS+1:GOTO 2360
2400 P(TS)=P(TS)+TH:TS=TS+2:GOTO 2360
2990 REM ERROR ROUTINE FOR SCALE
3000 SF=1/SF
3010 CALL"RESOLUTION",0,2
3020 ?"** This would overflow the screen **"
3030 ?:GOTO 2220
```

MEP Regional Information Centres

The Microelectronics Education Programme has now established its 14 Regional Information Centres. They cover Northern Ireland, Wales, West Midlands, South Yorkshire and Humberside, South West, Southern Counties, West and North Yorkshire, The North, Merseyside with Cheshire, Great Manchester and Lancashire, Capital, East Midlands, Eastern, and Chiltern.

The addresses of the RIC's and an outline of their functions is given in CALNEWS 18 (free from Judith Morris, CEDAR, Imperial College Computer Centre, Exhibition Road, London SW7). Each RIC will have many demands made upon its funding and time. It is up to primary teachers to make their needs known and to suggest to their RIC the type of in-service work they would like to see organised. If you have ideas, give your local director a ring.

R. K.

A PRIMARY B.A.S.I.C. - Part 5

Some aspects of language teaching require a 'Gestalt' view of words and sentences, and emphasise meaning and context. In other cases we wish to examine and analyse symbols, for phonetic work, spelling or punctuation. The computer excels at analysis. This is widely understood in relation to 'number crunching', but it is just as powerful and precise in 'string handling' - searching through sequences of symbols.

Most versions of BASIC in microcomputers have been updated to sort, isolate or alter letters in words for many different purposes. We will illustrate this, for a sentence stored on a DATA line, by replacing all the vowels by asterisks, and then requiring the children to correct the altered text. In a small group, one child could type in the missing vowel as agreed by discussion.

For a preliminary exercise in string handling, look at Program 1 and its print out. LEN (A$\emptyset$) in line 120 is a function which is defined as the number of symbols ("length") in A$\emptyset$. Line 130 records this count at the top of the print-out: there are 11 symbols in "MICRO-SCOPE". (Note that all symbols are counted, including spaces where they exist). The most important function is MID$\emptyset$. Line 140 illustrates its use. Starting with the 3rd symbol of A$\emptyset$ and taking 5 symbols, "CRO-S" is printed out next. Also we can 'add' strings end to end: this is called 'concatenation"; it is not numerical addition. Line 150 concatenates two strings. The first is 2 symbols on the LEFT of A$\emptyset$ and the second is 4 symbols on the RIGHT: "MICOPE" is printed out. Next, the loop 160-180 is repeated 12 times (D = 0 to 11) and uses the PRINT "comma" tabulator. This is usually equivalent to ";TAB(14);" which we have met in our June 1981 issue of 'MICRO-SCOPE'.

Now look at the output from Program 2. The first two lines are instructions to the pupil, printed by lines 330,340. Next comes the whole sentence as modified by the replacement routine 360 to 420. The succeeding incomplete line shows the pupil at work: he has successfully typed A,A,I as underlined, and the next consonants LL W have appeared. The program waits for the next input: here only the correct letter will do - the rest of the keyboard is dead! Finally lines 580, 590 echo the corrected sentence.

In the routine 360 to 420, B$\emptyset$ is initially set at zero and then is extended by one letter at a time with consecutive letters from A$\emptyset$. Line 390 chooses the letter as M$\emptyset$; line 400 checks if it is a vowel and, if so, replaces it by an asterisk; and line 410 attaches the result to B$\emptyset$ by concatenation. Thus B$\emptyset$ becomes the complete modified sentence, and is printed by line 430.

In the routine 450 to 550, V is used to mark the positions of the asterisks, while C counts all the symbols. The loop 480/490 continues till C reaches an asterisk position. The symbols preceeding the asterisk are printed by line 500. The loop 510/520 waits for and checks the correct input. Line 530 prints it and 540 puts V=C, ready for the next step. So V takes the successive values 0, 2, 6, 11, 16, 20, 25, 28 of the asterisk positions. After the last asterisk nothing is printed by line 500, so line 560 completes the sentence. Line 510 needs some explanation. It is known as a single key input function. GET$\emptyset$ ( ) accepts any symbol from the keyboard for examination, but does not print it. One letter is accepted only, and the return key is not necessary to complete the input.

As an exercise, write a program to print all the words containing a specified digraph like -EA-, from a set stored by DATA lines.

John Fair

```
100 REM *********** PROG 1 ************
110 LET A$ = "MICRO-SCOPE"
120 LET L = LEN(A$)
130 PRINT A$;L
140 PRINT MID$(A$,3,5)
150 PRINT LEFT$(A$,2) + RIGHT$(A$,4)
160 FOR D=0 TO L
170 PRINT LEFT$(A$,D),RIGHT$(A$,L-D)
180 NEXT D
190 T=0
200 FOR C=1 TO L
210 IF MID$(A$,C,1) = "O" THEN T=T+1
220 NEXT C
230 PRINT "There are ";T;" O's in ";A$
240 END
```

```
RUN
MICRO-SCOPE 11
CRO-S
MICOPE
              MICRO-SCOPE
M             ICRO-SCOPE
MI            CRO-SCOPE
MIC           RO-SCOPE
MICR          O-SCOPE
MICRO         -SCOPE
MICRO-        SCOPE
MICRO-S       COPE
MICRO-SC      OPE
MICRO-SCO     PE
MICRO-SCOP    E
MICRO-SCOPE
There are  2  O's in MICRO-SCOPE
```

```
300 REM *********** PROG 2 ************
310 READ A$
320 LET L = LEN (A$)
330 PRINT "Look at the following sentence"
340 PRINT " Replace the vowels correctly"
350 PRINT
360 REM ***ROUTINE TO MODIFY SENTENCE**
370 B$=""
380 FOR C=1 TO L
390 M$ = MID$(A$,C,1)
400 IF (M$="A" OR M$="E" OR M$="I" OR M$="O" OR M$="U") THEN M$="*"
410 B$ = B$+M$
420 NEXT C
430 PRINT B$
440 PRINT
450 REM ***** PUPIL INPUT ROUTINE *****
460 V=0
470 FOR C=1 TO L
480 M$ = MID$(B$,C,1)
490 IF M$ <> "*" THEN 550
500 PRINT MID$(A$,V+1,C-V-1);
510 P$ = GET$()
520 IF P$ <> MID$(A$,C,1) THEN 510
530 PRINT P$;
540 V=C
550 NEXT C
560 PRINT RIGHT$(B$,L-V)
570 PRINT
580 PRINT A$
590 PRINT A$
600 DATA JACK AND JILL WENT UP THE HILL
610 END
```

```
RUN
Look at the following sentence
 Replace the vowels correctly

J*CK *ND J*LL W*NT *P TH* H*LL

JACK AND JILL W
```

```
RUN
Look at the following sentence
 Replace the vowels correctly

J*CK *ND J*LL W*NT *P TH* H*LL

JACK AND JILL WENT UP THE HILL

JACK AND JILL WENT UP THE HILL
JACK AND JILL WENT UP THE HILL
```

Towards a Policy for Teacher Training

It has been clear for some time that an enormous task of re-training lies ahead if we are to capitalise on the opportunities offered by micros. We shall expand on this theme. To open up discussion, we report on two recent papers and invite comments.

A MEP guidelines document, "Regional Teacher Training Programmes under MEP."

The needs of primary school teachers are included in the scope of this paper. Four broad domains of activity are identified: electronics; the computer as a tool; computer-assisted learning; and information technology. For each domain there is a national co-ordinator and an advisory group of experts.

'Supply Office? Can we order a micro to fill in for the teachers out on courses learning how to use the micro?'

"MEP is commissioning a number of short-term projects for the development of training and classroom materials. These will be made available to LEAs for use and evaluation in their regional teacher training programmes."

Training is envisaged at three levels: "awareness", to be provided by Regional Information Centre: "expertise", including skills needed to apply and adapt the technology effectively in the classroom, and "advanced", a level at which "teacher training and curriculum development are not distinct."

"The demand to introduce a considerable majority of all teachers to a new technology does require a larger number of practitioners who can lend their experience to running shorter familiarisation courses. This is the principle of recursive training."

Regional groups of LEAs are being asked to submit proposals following these guidelines. MEP will shortly issue a further document of guidance, including a list of objectives and a variety of suggested strategies.

B The second paper was recently discussed at a meeting of MAPE's Steering Committee. It is concerned with the primary field, and reflects a similar outlook to that of MEP.

1. First priority is for courses for teachers with ready access to a micro, preferably in their own school. Any courses of preparation for teachers without access are quite separate, with different needs and methods.

2. Consider this breakdown of needs (any particular teacher may need more than one section):-

	(a) EDUCATIONAL ASPECTS	(b) COMPUTING ASPECTS
LEVEL 1	Selection, use of programs in context.	Ability to run, control and monitor programs.
LEVEL 2	Planning programs and adaptions.	Programming: enough to write simple programs, adapt others.
LEVEL 3	Evaluation skills; teacher leaders in planning and applications.	Advanced programming; conversions; technical "consultant" for other teachers.

3. All levels of (a) need a substantial element of discussion and evaluation by participating teachers, and will best be carried out in a college or teachers centre: support from BBC programmes, A/V packages and books will be necessary as adjuncts.

4. The emphasis in (b) is more on instruction, but it will often need immediate support in a 'workshop' with machines available. Distance learning could be a substantial component.

5. Aim should be for every school with a micro to have one teacher at level 3(a); every local area to have <u>some</u> at 3(b), and more at 2(a) and 2(b). **(The school is not the unit for development and evaluation** - needs more co-operation). As soon as possible, all teachers should have opportunities to acquire level 1 skills <u>either</u> directly from a course <u>or</u> indirectly through a teacher leader in the school.

T.L.

THE BOOK IS DUE NOW!

Roy Garland's long-awaited compilation, arising from last year's Exeter Conference, will be published in April. It is called "Microcomputers and Children in the Primary School." (Falmer Press, Balcombe, Lewes, Sussex.) Paperback version is £5.25, or £4.50 for pre-publication orders.

THE BBC COMPUTER LITERACY PROJECT

In the last issue of 'MICRO-SCOPE' Hazel Sumner of the BBC outlined for us exciting prospects of powerful support. We shall monitor developments closely, and provide a platform for teachers to express their needs in this field. This progress report notes early problems and promises in the TV series, the NEC 'BASIC' course and the new Acorn micro.

1. 'The Computer Programme'. The planners are as yet unsure of their audience. Transmissions on Monday afternoons, with repeats on Sunday mornings, reach only a minority of well-motivated viewers. A direct informative approach would be appropriate. But the style is glossy and entertaining, as if to captivate and retain a mass audience. A 'lay' presenter is encouraged and helped by an expert, a successfully reassuring ploy.

The series provides a good general awareness of computers, their structure and applications. Some of the images are striking and imaginative. If the VW Beetle had developed from its first model at the same rate as computers, we would now have a car capable of 600 mph. and 38,000 mpg. .... and costing 50p.

The expert refers to computers as being very stupid sometimes, or very clever. Whilst it is tempting to humanise computers, this runs counter to the series' avowed aim of demystification. The early programmes fail to question whether all the changes will be for the benefit of mankind, and to stress that rapid education is the best safeguard. The computer is shown coping with the problems of the information explosion. There are significant implications for teachers as managers of resources including databases and telesoftware.

This first series is not designed to examine the educational potential of microcomputers. We await with impatience 'Micros in the Classroom' and 'Learning About the Chip' (see 'M-S 4', P4.6).

2. The 30-hour BASIC course. The TV series presents BASIC as the universal beginner's language, available on all microcomputers. Its twin defects, of having no standard form and having a structure which allows more mistakes than other languages, are mentioned in passing. This course is the first to be produced by the National Extension College in association with the BBC. The NEC of course, is very experienced in all aspects of distance teaching and this is reflected in the care with which this package has been constructed. It should help those who wish to learn BASIC programming but who do not have the time or the opportunity for face-to-face tuition. The book, which is the mainstay of the course, has been written by Clive Prigmore and costs £5.50. Mr. Prigmore is to be congratulated on producing an attractive, readable and informative text which is generally easy to follow. His development of programming follows a well-chosen sequence and the introductory ideas should appeal to most newcomers.

Inevitably, with such a wide range of BASIC dialects available, there are some factual errors. On P.166, for example, it is stated that linking output is only possible on the BBC microcomputer - but other machines in common use, like the RML 380Z, can simulate this. More disturbing is the number of printing errors likely to confuse novices working carefully through the course. A glaring example is found on p.136 where the output shown is not true for J=4 and J=5. We hope that the publishers will urgently compile a full errata list. The course is supported by a referral service and 'Flexistudy' groups, both based on centres (usually colleges of F.E.) spread throughout the country.

Alan James, John Fair (Newman College)

3. The BBC/Acorn Microcomputer. A quick glance through the first edition of the User Manual reveals a wealth of instructions which defies belief. A full review of the potential of this new computer would demand many man-hours of work, and we would rather suggest that you get your hands on a machine and see for yourself.

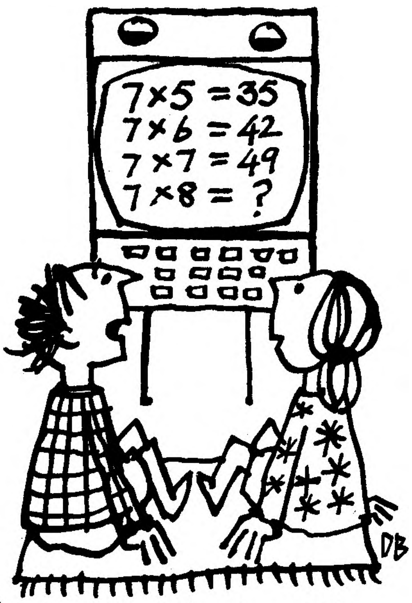
This review is based on Model A, as provided for in the DOI/DES Micros in Schools Scheme. Production problems have caused delays in the despatching of orders. We would say, however, that the completed product is well worth waiting for, and seems to fulfil the very good technical specifications promised.

An essential feature of a good microcomputer is the ability to display clear, graphical information. The BBC machine does indeed provide this, even in the limited graphics of Model A. We believe that the commands are particularly easy to use. Although not of the highest resolution possible, the Model A machine allows the construction of complex video pages. Additionally, it is possible to use four colour settings at one time on the screen, including black! Model B allows this to be extended to sixteen colours in certain modes. The colours include foreground and background, flashing and striped. In fact we have not yet been able to explore them all. We also liked the facility to fill triangles, where some machines can only fill rectangles - The triangle allows more complex shapes to be shaded with the minimum effort.

We turned our attention next to problems of mechanical stability, especially bearing in mind that the machine would spend time under rather rough hands! The manufacturers recommend that nothing is placed on the flat portion of the case. We have heard comments that this should be strengthened. A rather disturbing factor was the amount of heat generated by the power supply. Perhaps our machines, rather early off the production line, are not as good in this respect as later versions - but we can cook eggs on one of our machines!

For anyone with a prior knowledge of BASIC there should be no problem in writing programs. Those new to the computer world might experience difficulties in ploughing through the User Manual. The editing facilities are excellent, making use of cursor control and on-screen copying/editing. They proved to be very easy to use.

It was surprising to find that sound output is available from Model A. We already knew that this was the case for Model B. The commands are not explained in the manual, but after several attempts a suitable tune emerged.



'I'm getting just a bit sick of all these repeats.'

It is possible to specify the note value and the duration, using one command. Another command allows the user to alter the waveform envelope shape, and hence the tonal quality. No information was found for this except that 14 parameters are required. Simple really!

The machines at the Centre have been demonstrated to several groups of Primary Teachers. From the reaction we have seen we gather that this is just the sort of resource needed in the primary classroom. It is a pity that more software is not available at present. This will change rapidly, since the BBC Machine will be finding a place not only in formal education but also informally in the home. Many agencies are being asked to provide material and whilst much will be of general interest, there should be some useful software for the educational field.

We must confess to being very impressed with the Model A computer and are longing to receive the Model B. We are told that this latter machine is twice as powerful and with its extra expansions can provide a degree of powerful computing, at a relatively low price, not found in many machines four times the price.

Chris Pedley, Mike Moore,
MACE W. Midlands Regional Information Centre.

On 1st February 1982, the price of both models went up by £64, to £299 and £399 respectively. We gather that orders placed before this date are protected from the rise. For more information about the Project write to: Broadcasting Support Services, PO Box 7, London W3 6XJ. 'The Computer Book' (BBC Publications, £6.75) covers the same ground as the TV series, and should prove a useful addition to a school library. The 'BBC Software Library' initially contains a Welcome Pack of 16 programs. MICRO-SCOPE invites comments, especially from novices following the project!

REFLECTIONS AND PLANS

As the head of a primary school which will shortly be taking delivery of an RML480Z computer, I would like to raise and comment on several issues connected with computers in primary schools. I must admit at the outset that my "hands-on" experience is limited to six weeks with a ZX81, but even that brief "affair", together with reading various publications, including "Micro-scope", persuaded me

a) that the school should go ahead and take advantage of Wolverhampton Education Authority's offer to contribute 50% towards the cost of RML480Z;

and b) that there are certain important issues that need to be thought about and discussed at as early a stage as possible.

First of all, the question of hardware. All the first-hand accounts I have read (in "Micro-scope") of schools' experiences in this field, have been concerned, naturally, with the introduction of <u>one</u> computer into a school. That will shortly be our concern, too. However, we also need to consider <u>now</u> what the situation might be, and what we would want it to be, in four or five years' time. If computers prove to be as valuable in primary education as they promise to be, if they do have applications in <u>all</u> curriculum areas and for <u>all</u> age groups, then one computer in a school will provide no more than brief, tantalising and ultimately frustrating experiences for both children and teachers. So we must be thinking now of the implications of working towards one computer per class or year-group. What of the cost involved, for instance? We must assume, surely, that neither the Departments of Industry and Education nor L.E.A.'s will offer 50% towards the cost of second and subsequent computers in a school. The school, therefore, will have to buy them unaided, using capitation and/or school funds. Even allowing for a probable drop in prices, I cannot see primary schools being able to afford further computers in the present £500 - £600 range. However, £200 - £300 might not seem too large a sum to put aside or raise each year for four or five years to build up an adequate number of computers for, say, a two-form entry primary school. Such a school, then, might have one computer with a large memory and expansion capabilities for a printer etc., and several smaller, hopefully compatible, machines. Several manufacturers have two models which would fit into such a scheme, but the system we should really hope lives up to its promise and proves suitable for primary schools must be commissioned by the B.B.C. An initial purchase of a Model B machine, VDU and cassette recorder for about £400 (with a contribution from the Department of Industry), followed by a number of Model A's at about £300 each all in, should be within the budget of any determined school.

Complementary to a medium-term hardware plan such as the above, the first point I wish to make about software is that there should be as much emphasis on relatively simple, low-memory programs as on longer ones. Of course, sophisticated simulations need complex, high memory programs and they, along with other programs that are unavoidably lengthy or use, say, a multi-colour screen format, will have to be run on a school's "main" computer. But I suspect that a large number of the lengthy programs that will no doubt shortly be published or produced could with profit be re-written as a series of shorter programs.

The programs that I have in mind are those which provide for a number of levels of difficulty and/or a number of parallel alternatives (eg + - x or ÷). The excellent-looking "GRIDREF" program published in "Micro-scope 3", for example, would benefit in my opinion from having each of the four alternatives as a separate program.

My reasons for recommending shorter programs wherever possible are as follows:

a) the already implied reason, that they could be run on computers with less memory;

b) the shorter loading time, assuming that most primary schools will be loading from cassette. This advantage is obviously outweighed to some extent by having to load more programs, but ....

c) most teachers, initially at any rate, will probably be happier to have a group of pupils working through a more or less pre-determined program;

d) easier teacher control over the <u>contents</u> of the programs.

This last reason needs amplification and also touches on the issue of teacher-training in this field. Assuming that the teachers in a school have become enthusiastic about the possibilities of computers in primaries (through seeing first-class software in action), and that their classes have reasonable access to one (through the school having enough computers!) they will eventually find that they want to modify or adapt certain programs to meet the precise needs of particular individuals or groups of children. Now given that the first stages of teacher training will lead to an elementary understanding of the school computer's keyboard and BASIC and of how programs are constructed, the next stage should include an introduction to editing techniques. Teachers would then be able to take a program and change parts of it (the way it addresses the pupil, the number of questions given, the value and range of any random numbers, and so on); and those who did this would not only be providing better programs for <u>their</u> pupils - they would also be increasing their own understanding of program construction and would be better able to contribute to the production of new programs. Such teacher involvement and education (largely <u>self</u>-education, in fact) will only be achieved, however, if enough <u>short</u> programs of quality and real value in the classroom are available for them to experiment on. This is where a magazine like "Micro-scope" can provide an invaluable service - by printing short programs (eg one alternative of "GRIDREF" or a program to practise mental addition) together with notes and suggestions as to where and how alterations might be tried. Of course, such an approach will not be possible with many types of program, but wherever a complex program could be broken down into a series of shorter programs, the increased "teacher-friendliness" would, I feel, make the extra work involved worthwhile.

The final issue I would like to raise is the need constantly to assess the purpose and suitability of Computer Assisted Learning programs. It is a need which everyone claims to recognise, but which, in our enthusiasm for the new techniques at our disposal, in our eagerness to prove their worth in <u>all</u> areas of the curriculum, is always in great danger of being overlooked. The result could be a backlash on the part of both pupils and teachers.

The justifications of novelty and higher motivation must not be excuses for programs which do nothing that a teacher, a blackboard, a book or a worksheet could not do as well if not better. There are so many areas in which C.A.L. has a lot to offer that it is irresponsible to force it into areas in which it does not. There are two examples from "Micro-scope" which I think belong to this latter category - others may disagree, of course. First, the program which generates a random, personalised, first sentence of a story and then instructs the pupil to finish it ("A Primary BASIC - Part 3" in "MICRO-SCOPE 3"). Not only would most teachers (I hope) feel that this was a rather unimaginative approach to creative writing (especially without any preliminary discussion), but there is also a real danger that the pupil's reaction, once the novelty of seeing his own name has worn off, will be "Oh no! It's just like those boring sentences he gives us on the blackboard in another disguise." Not all C.A.L. programs will be new and exciting, but at least let us not use computers to perpetuate bad teaching techniques. My reaction to the Cloze Procedure program in Issue 4 is more complex. I can think of some kinds of cloze exercise which would benefit from being on a good program, for example an exercise where a particular response for each deletion was being sought, with the pupil responding to contextual or phonic cues which the program could highlight if the child was in difficulty. However, if a variety of responses is being encouraged for general language development purposes, a cloze exercise cannot be better than a worksheet or book, the pupils working individually or in small groups and then coming together to justify their choices in a group or class discussion with the teacher. Meanwhile, another group could be using the computer for something else!

All C.A.L. programs, in my opinion, need to justify themselves on one of the following grounds - that they

a) use a new, educationally sound technique;

b) extend an existing, educationally sound technique;

or c) use an existing technique in a way that is more efficient or rewarding.

In these early, exciting days of computers in primary school, we obviously need pioneers who are prepared to explore every avenue and risk producing imperfect programs. However, we also need teachers who will spot the cul-de-sacs and criticise programs that are not compatible with good primary teaching. Above all, we all need to force ourselves to stand back regularly and take at least a medium-term overview of what future we would like for micros in primaries.

J. A. Sheard,
Headteacher,
Ashmore Park Primary School,
Wednesfield.

THOUGHTS ON SOFTWARE - Provision and Reviews.

There would seem to me two alternatives with regard to the provision of software for MAPE members. Let me take them in order.

1. Running our own software library. The obvious drawback to this is the amount of work entailed. There are many machines on the market, and it would surely be necessary to have one of each available to do the copies. There is the time needed to copy, the administrative work required to post, not to mention the cost of it all. Putting this extra burden onto an individual would I suggest be rather onerous. Admittedly the price of software could be kept down this way, but it would not reflect the true economics of the situation.

2. Relying on commercial undertakings. This, I suggest, is a far more effective way of dealing with the problem, especially if we can negotiate advantageous terms for our members! Advertising, copying, documentation etc. would be taken care of, and since authors would get a reasonable return for their efforts most people would be happy. What one could term the editorial control could remain with MAPE if we had a reasonably simple way of reviewing any software. I say reviewing since I do not think we are qualified to make mandatory evaluation of any software.

Some of the following ideas arose in conversation with Bryan Spielman:

Software houses presenting programs for review should provide the following information:

a) The educational aims and objectives of the program.

b) The type of machine it is intended for and any non-standard peripherals that are required.

c) The age/ability range of the intended audience.

d) Behavioural or cognitive style.

e) Skill building or concept formation.

f) Other materials that may be necessary.

g) Possible lead in, follow up work.

h) Area of curriculum.

There are obviously other things that should be added to this list.

Since review can be rather subjective I would suggest a 1 to 5 scale for the following questions (some would need a fuller treatment):-

Aims:

a) Are the educational aims and objectives fulfilled? (scale)

b) How are these aims fulfilled?

c) Quality of presentation-graphics etc;

d) All information available from the program;

e) Other information sources;

f) Validity of the program;

g) Necessity of the program-the area could maybe be covered in another way more efficiently.

With regard to the program itself:

h) Robustness;

i) Formatting;

j) Ease of running;

k) Able to be run by a non-specialist teacher.

Documentation:

l) Clarity of presentation;

m) Standard of packaging;

n) Level of helpfulness.

Children's reaction:

The best people to write this would be children, with an indication of the ability and age of the child writing the review.

Tony Mullan
Plympton St. Maurice C.P. School,
Plymouth.

'So you're considering extending your sales outlets?'

CODING PROGRAM

Here is a little program that encourages logical thinking among pupils and also places securely in their minds precisely what a code is. The teacher has also ample opportunity to encourage aspects of word recognition and to discuss the frequency of letters and letter-combinations.

The game is in two parts. Firstly, the teacher or pupil types a short message such as "THE GOLD IS BURIED UNDER THE OLD OAK TREE." and presses RETURN. The computer (at line 7Ø) clears the screen and prints the message - the same one - and asks what operations it must perform on the message. Let us suppose that the child wishes all letters to be moved down the alphabet 5 spaces. He types '5' or '+5'; the screen is now cleared again and the coded version of the message is printed.

Again the computer asks what operations it should perform, but the first child has given way to another - or a group - whose task it is to find the original message. The number of tries is counted.

Clearly, for the message to be decoded, the working child must type '-5' or '+21' or '21'. Since he cannot know this, one sure way is to type '1' every time. There is an automatic wrap-around at the end of the alphabet, and full-stops etc. are reproduced as normal. (Note that a comma is not allowed. Most BASICS will treat this as the end of message.)

When children are adept at this form of the game, a cunning variation is introduced. Alternate letters can be moved separately. Thus, the movement may be +1, -2, or any combination desired. This is much more difficult of solution, as finding the correct treatment of the jumbled message involves the attempt to fit words to alternate letters only.

For instance, if the coded word is EOGJNF, the word ENGINE might fit, using letters 1, 3 and 5. Further examination shows that subtracting 1 from the other letter values does in fact produce ENGINE and instructing the computer Ø, - 1 would produce that result.

This second version of the game is certainly not easy and will keep top juniors occupied for a long time - and not a few adults!

Derrick Daines, Carsic Primary School,
Sutton-in-Ashfield, Notts.

```
10 PRINT TAB(6);"CODING AND DECODING PROGRAM"
20 PRINT TAB(6);"==========================="
30 DIM C(2)
40 PRINT: PRINT "PLEASE TYPE YOUR MESSAGE."
50 INPUT M$:S=-1:A$=M$
60 REM - CLEAR THE SCREEN IN PAGE MODE
70 PRINT CHR$(12)
80 PRINT"I HAVE IN STORE THE FOLLOWING:"
90 PRINT:PRINT "'";M$;"'"
100 PRINT: S=S+1
110 PRINT "HOW SHALL I TREAT THE MESSAGE?"
120 PRINT "(PRESS RETURN ON AN EMPTY SET TO EXIT   THE PROGRAM)"
130 INPUT LINE D$:IF LEFT$(D$,1)="+" THEN D$=RIGHT$(D$,LEN(D$-1)
140 IF D$="" THEN 310
150 INPUT LINE E$:IF LEFT$(E$,1)="+" THEN E$=RIGHT$(E$,LEN(E$-1)
160 C(1)=VAL(D$)
170 IF E$="" THEN C(2)=999: GOTO 190
180 C(2)=VAL(E$)
190 PRINT: PRINT: N=1
200 REM - SHIFT MESSAGE LETTER BY LETTER
210 FOR X=1 TO LEN(M$)
220 B$=MID$(M$,X,1)
230 IF B$=" " OR B$="'" OR B$=CHR$(34) OR B$="-" OR B$="." THEN 240 ELSE 250
240 C$=C$+B$:GOTO 280
250 C=ASC(MID$(M$,X,1))+C(N):IF C>90 THEN C=C-26:GOTO 270
260 IF C<65 THEN C=C+26
270 C$=C$+CHR$(C):IF C(2)<>999 THEN N=2/N
280 NEXT X: IF A$=C$ THEN 380
290 M$=C$: C$="":GOTO 70
300 REM CLEAR SCREEN
310 PRINT CHR$(12)
320 PRINT "THE FINAL STATE OF YOUR MESSAGE WAS:"
330 PRINT: PRINT "'";M$;"'"
340 PRINT: PRINT "THE ORIGINAL MESSAGE WAS:"
350 PRINT: PRINT "'";A$;"'"
360 PRINT: PRINT "YOU HAD";S;"TRIES."
370 END
380 PRINT CHR$(12)
390 PRINT"******************************************"
400 PRINT"***  C O N G R A T U L A T I O N S  ***"
410 PRINT"******************************************"
420 PRINT: PRINT"YOU HAVE CORRECTLY DECODED THE MESSAGE"
430 PRINT: PRINT"IT WAS - '";A$;"'": GOTO 360
```

```
      CODING AND DECODING PROGRAM
      ===========================

PLEASE TYPE YOUR MESSAGE.
? MICROSCOPE
I HAVE IN STORE THE FOLLOWING:

'MICROSCOPE'

HOW SHALL I TREAT THE MESSAGE?
(PRESS RETURN ON AN EMPTY SET TO EXIT
? 2
?


I HAVE IN STORE THE FOLLOWING:

'OKETQUEQRG'

HOW SHALL I TREAT THE MESSAGE?
(PRESS RETURN ON AN EMPTY SET TO EXIT
?
```

```
      CODING AND DECODING PROGRAM
      ===========================

PLEASE TYPE YOUR MESSAGE.
? MICROSCOPE
I HAVE IN STORE THE FOLLOWING:

'MICROSCOPE'

HOW SHALL I TREAT THE MESSAGE?
(PRESS RETURN ON AN EMPTY SET TO EXIT   THE PROGRAM)
? 2
? 0


I HAVE IN STORE THE FOLLOWING:

'OIERQSEORE'
```

```
      CODING AND DECODING PROGRAM
      ===========================

PLEASE TYPE YOUR MESSAGE.
? MICROSCOPE
I HAVE IN STORE THE FOLLOWING:

'MICROSCOPE'

HOW SHALL I TREAT THE MESSAGE?
(PRESS RETURN ON AN EMPTY SET TO EXIT
? 0
? 1


I HAVE IN STORE THE FOLLOWING:

'MJCSOTCPPF'
```

```
      CODING AND DECODING PROGRAM
      ===========================

PLEASE TYPE YOUR MESSAGE.
? MICROSCOPE
I HAVE IN STORE THE FOLLOWING:

'MICROSCOPE'

HOW SHALL I TREAT THE MESSAGE?
(PRESS RETURN ON AN EMPTY SET TO EXIT   THE PROGRAM)
? 2
? 1


I HAVE IN STORE THE FOLLOWING:

'OJESQTEPRF'
```

THE MICRO YEAR

In November 1980 I came across the Sinclair ZX80 micro-computer for the first time, during a residential weekend at Fowey Teachers' Centre, Cornwall. The thing that fascinated me most, at the time, was the challenge of controlling the hardware itself and not its possible use in the classroom.

I borrowed it, and the following week saw 'FRED' (as it was named by the children) installed in the classroom and being used at every available moment between 8.30 and 4.30. My class of ten and eleven year old children were as captivated by it as I was, and were soon running their own programs. They produced hundreds of different variations on the theme of 'Tables Tests'. Some were straightforward, some kept your score, some printed out the most unflattering statements when given the incorrect answer, but all were eagerly played, tirelessly, for hours by the other children.

The test then took in subtraction and addition, but not division. They all found the ZX80 integer arithmetic either very funny or frustrating. A couple of boys spent nearly a week writing dozens of unsuccessful programs for long division. I was surprised at their tenacity, but when I asked them if they would rather do a simpler program I was told that 'computers' were the things to do long division and that they were going to make the ZX80 do it if it was the last thing they did!

Shortly after this episode the ZX81 was announced and I ordered one along with a RAM pack containing 16 times as much memory. This solved the integer division problem but created another: what to do with eight decimal places of answer!

With the arrival of the ZX81 on the market came an explosion in the software market for Sinclair machines. Suddenly there were thousands of programs available, most of which seemed to be boring or educationally feeble. Almost without exception they showed that the people programming for the education market were very much out of touch with the real world of the classroom. I suspect that they have not noticed the change since they were in school in the pre-1970's. However inadequate, one must admit that those programs have provoked people like me into writing their own programs and articles for magazines in response.

A year later, at another weekend at Fowey, I have come into contact with the micro again! This time there were several. Some 380Z's and an Apple, and a lot of software to go with them. I almost dreaded coming into contact with more expensive machines lest they should bewitch me into wanting one. I need not have worried as I was left singularly unimpressed. I would have liked one or two programs for my classroom, but I felt that most did not justify the expense of the equipment. Even with a D.O.I. grant it would cost over £500. Of course, here I must admit my bias as my ZX81 plus printer, cassette recorder, RAM pack and additional 'proper' keyboard totalled less than £200.

A Headmaster asked a few weeks ago if I wouldn't rather have a new BBC computer, to which I replied that for the money I would rather have 3 ZX81's .... He looked a little puzzled until I explained why, after much deliberation, I had come to this conclusion. So little appropriate software is available that its use is not the most important side to computers in primary education. Using computers to teach things seems, at present, uneconomical and in many respects underproductive.

The hardware offers possibilities which need little or no backup from software. The major one is the task of programming, which has many reasons for recommendation. I once considered that computers could only be programmed by adults with a high degree of mathematical ability - then I realised that I could do a bit of programming myself! Having worked with the ZX80 I discovered that my bright ten and eleven year old children could also program and that, I decided, was definitely the limit ...... it wasn't! Now my eight and nine year old children, bright and not so bright, are programming, each at his/her own level. It is not really so surprising when one considers that a program to print "FRED" a thousand times is as follows:

```
10 FOR A = 1 TO 1000
20 PRINT "FRED"
30 NEXT A
```

"What's the point?", is the obvious question. Firstly, manipulation of computers and therefore familiarity with them is a desirable thing in itself, considering the present trends in society and technology. Secondly, the logical thinking involved in the manipulation of the computer via programming would seem to have a beneficial effect on other areas of the curriculum, for example mathematics and problem solving. Thirdly, its sheer fascination as a novelty - if you can call a teaching aid that is used nearly all day, every day for a year a novelty - means that it can be offered as a carrot or withdrawn as a punishment. I have known it turn the villains of the classroom into apparent 'academics' in order to use the computer to program a quiz!

There are many other reasons, some of consequence and some trivial, but the most important is in the field of communication. Computers seem to have a special quality in that their presence seems to generate the need for communication. Not just the communication of facts, but general communication by the people using it or near it, teacher/child, child/child, child/parent etc.

One of the most important functions of primary education is to teach children to verbalize their problems and to communicate. Here, in my classroom at least, the computer plays a significant role, no matter how it is being used. From one point of view it looks as if virtually anything to do with computers can be 'educationally valid' and from another (that of the educational software producers) that their expertise is needed if micros are to be of any value in the classroom whatsoever.

With reservations I tend towards the first view. When I look at the software market it seems to me that there is more useful material appearing in the games section than in that dubiously entitled educational. For the latter to be of use it is imperative that the hardware manufacturers, the software producers, the makers of peripheral devices and the teachers should get together and decide what is needed, on a commercial basis, as opposed to the present amateur dabbling! I am not unaware that there are some notable exceptions.

Programs need to be tested in schools and thoroughly reviewed by a number of teachers in differing situations, as teaching styles and methods, like learning styles, are so different.

The same group of people (and here I stress not as educators or programmers, but as a complete group) need to formulate the aims of computing within the total framework of the education system. At present the principal aim appears to be one of making a living commercially or to provide yet another entry on application forms for those involved educationally! It may be that I am being unduly cynical and that already there are manufacturers working secretly, about to unleash packages to set the educational world on fire and to justify the expense involved in the purchase of sophisticated systems. I will just have to wait and see. Ideally I would like a number of Sinclairs for small-group programming work and something much larger and more expensive for small class use. To back them up I would like a good service contract for all items plus a software service where one could send programs or ideas for programs to have them written properly or tailored to one's own specifications. Hopefully this would cost the enquirer little and the firm would make its money by selling a needed and useful item elsewhere.

One can but ask!

J. N. Seth

COMPUTER ASSISTED ADMINISTRATION AT FOXFORD

During the last three years an attempt has been made to use the Tandy micro-computer to assist with some of the more routine, and often mundane, tasks of administration encountered in any school. These tasks can often take up a lot of staff time especially in a large secondary school.

The starting point for the system in use has been the original file of basic, non-confidential, information about each pupil on roll. Use is made of the Tandy package "PROFILE" as the basis for the system and this has many advantages for the non-experienced user as it contains several standard routines for data manipulation which are quick, effective and simple to operate.

The file contains the following items, each stored as a separate "field" within the record:-

> Sex, Name, Date of Birth, Address, Post-Code, Tel. No., Country of Origin Code, Year and Form, Primary School, Parent/Guardian.

This method of storing information means that sorting and updating of the records can be very speedily accomplished even by an inexperienced operator.

In making use of the basic information file there have been three main divisions: Nominal Roll Administration, Pupil Timetable Administration, Staff and Timetable Administration.

(a) Nominal Roll Administration

The system is used to provide all the lists and figures that are required in the school. These include lists of Tutor Groups, House Groups, Year Nominal Rolls, statistical details for L.E.A. or D.E.S. requirements including Form 7 (Schools) and analysis by tutor group, date of birth or country of origin.

The main advantages over the manual system are speed and accuracy. For example, if the main record file is accurate there will be no spelling or date of birth errors in any of the listings produced by the printer. Essentially, the only typing involved is the entry of the initial information as pupils are admitted or change their address. At the end of the academic year the computer can be programmed to update all Year/Form records without any re-typing of records and therefore accuracy is ensured across what can be a very "error prone" transfer process when done manually.

(b) Pupil Timetable Administration

In this school all pupils in Years Four, Five and Six have an individual timetable based on their own needs and requirements. The computer helps tremendously with the administration of this.

(c) Staff and Timetable Administration

The assistance given by the computer in this area includes Room Free Checks, Staff Free Check, Staff Absence Cover, Staff Location, copies of Pupil Timetables and Option Choice list for staff mark/ assessment records.

Not all the above sections are equally developed at this stage and work is continuing as time allows.

Other areas which are currently being examined with a view to computer assistance include School Fund Accounts, Capitation Expenditure Accounts, Examination administration including entries, statistics, exam timetabling and record keeping, Parents Evening Appointments and Leavers'Location and Placement Records.

The emphasis throughout has been to use the computer as a tool to assist with tasks and not to allow its use to dominate or influence any administrative or educational decisions.

D. Lewin, Deputy Head,
Foxford School, Coventry.

COMPUTER ASSISTED ADMINISTRATION AT FOXFORD

"PROFILE" SYSTEM

DATA FIELDS: Sex; Name; D.O.B.; Address; Postcode; Tel.No.; Origin Code; Form; Primary School; Parent/ Guardian

Changes and adjustments to Records "EDITING".

Sorting using any single "Field".

Listing using any single "Field" as basis.

Nominal Roll by Year Groups - with or without Pupils Subject Choices.

Nominal Roll by Houses with or without Pupils Subject Choices.

Nominal Roll by Tutor Groups with or without Pupil Subject Choices.

4th/5th Subject lists giving Name and Form from Option Choices.

* * * * * * * * * * *

Possible Future Developments

School Fund Accounts : Capitation Records : Admission Procedure : Staff Location Booklet
Leavers Location and Placement Record and Statistics : Staff Timetables : Examination Administration
and Entries and Statistics : Examination Timetable : Parents Appointments Evenings.

FOXFORD PROGRAMS

Tutor List Printing
View Single Records
Count Numbers in Exam Subjects
Count Numbers in Options
Advance Tutor Group at end of Year
Origin Analysis

D.O.B. Analysis
Summary of Numbers in Tutor Groups
4th/5th Individual Pupil Timetable Printing
Room Free Check
Staff Free Check
Staff Absence Cover

PROGRESS REPORT ON TELESOFTWARE

> In M-S 4 we introduced the Telesoftware and Education Project based at Brighton Polytechnic. The following extracts from the 2nd newsletter, just issued, show exciting progress in what should prove to be a key development.

The project is currently transmitting 140 pages of telesoftware - 68 on ORACLE and 72 on CEEFAX. This represents seventeen complete programs plus the telesoftware information pages. All these pages are available to any teletext receiver, but it is only the telesoftware set which can actually record the programs. There are three levels of telesoftware information broadcast: Firstly, an INDEX PAGE (701 CEEFAX, 175 ORACLE) listing the programs available on the service. Secondly, a program MASTERPAGE, describing briefly the particular program. Thirdly, PROGRAM SOURCE CODE pages - the program itself.

TELSOFT BASIC is closest to that used in the RML 380Z, itself a popular micro in schools, and we have been able to collect about a hundred 380Z programs. Transferring programs presents certain problems and for this project, translating graphics has been the principal difficulty. The screen layout is entirely different on the two machines, although both operate low and high resolution graphic images. To further demonstrate the potential of the system we are preparing to transmit in other BASIC dialects for other micros, e.g. APPLE, by transmitting the programs as TELSOFT data and passing them straight through the system.

The consistency of telesoftware reception in the schools is now at a high level and the overall performance of this technical side of the project has removed all doubts about the efficacy of broadcasting software. Some early transmission difficulties were quickly overcome, and the 1st October change to four line teletext halved program recording times - also thereby neatly doubling the expectation of new ones!

It has been the graphics capabilities of this telesoftware design which has excited most immediate interest in schools. The screen has been used to demonstrate programs or computer programming techniques to groups, where the quality of display enables easier reading at a distance. For programmers, the colour graphics have proved the most accessible feature of the system. Using graphics, programs employing split screen information displays, animated or sequenced teletext pictures have been written in schools to sit alongside the project's own developments for telesoftware display. Indeed, some pupils with no computing experience have taught themselves enough BASIC to exploit the screen, hence a noughts and crosses program giving a full six feet of paper print out - most definitely all their own work!

Listening to teachers on this project it is clear that the scope of many CAL programs is simply too ambitious, demanding a high level of teacher commitment for uncertain results; although other CAL applications are criticised for accentuating the trivial. Obviously a lot more development is necessary before educational software achieves consistent results. The television basis of telesoftware has attracted comments from a wide range of subject areas, and the project is now moving on to explore the wholly new aspects of telesoftware - the integration of television, text and software.

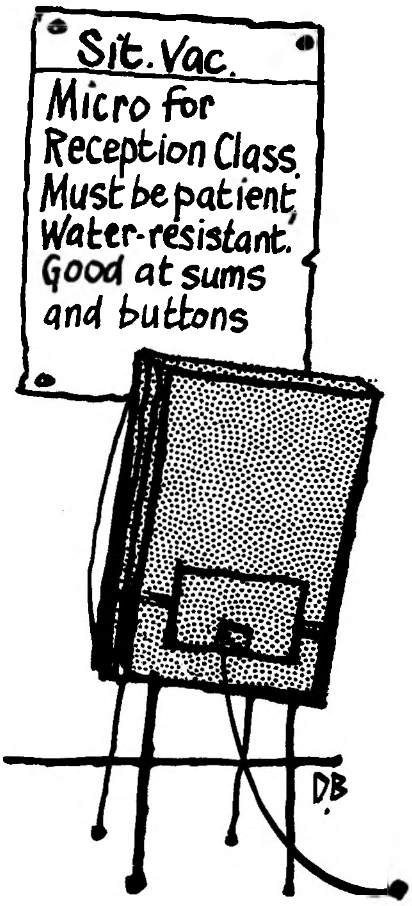
CHILD'S PLAY

I feel that a welcome addition to 'MICRO-SCOPE' would be a regular slot for short listings of programs which have proven helpful in the classroom. Allow me to set the ball rolling with the following. It was originally written to placate my three year old who "Never got a turn on the computer" because her big brother could type faster! She was delighted with it because it was all her own. ("Big boys don't want to know silly counting programs"!) It was later passed on for experiment with a group of reception class children.

The program gives practice in number recognition by generating a random number of ships (between 1 and 10) on screen. The only keys used are the number pad and the space bar. A correct response causes a screenful of stars in the shape of "g o o d" to appear. A wrong answer gives the child a chance to count again as the shape of a ship changes to its actual figure.

I would welcome feedback and improvements, like sound for correct response, or the recording of results, etc.

One final note on using the program with a tiny tot .....Imagine the scene... ....perched on a high stool, rag doll tucked under one arm and a sticky finger tracing slug-like toffee trails across your precious screen! YOU HAVE BEEN WARNED.



* * * * * * * * * * *

To convert the uninitiated, we must show them ways in which a computer can be a more useful educational tool than the traditional means. One powerful advantage the computer has is the role of motivator, as an animated blackboard/textbook.

Unfortunately, graphics and animation are often ignored in programming courses and are sadly lacking in many otherwise well thought out educational programs. On Merseyside, I am lucky to be close to two excellent users of these facilities in Peter Gill and Chris Eyre. At Exeter, I shall be demonstrating some of their programs along with some by Russell Wills and myself. As well as this I shall give tips to those who wish to improve their own Pet programming.

Jim Fawcett. Liverpool.

```
1 REMSIMPLE COUNTING PROGRAM FOR INFANT CHILDREN
2 REMBY J.FAWCETT 051:734:0786
5 A$="   ▒▇███ ┌───┐___▇██████████◥▇        ▀▀"
6 B$="      ▇███          ▇██████████        "
7 C$="                                        "
20 PRINT"":FORH=1TO8:PRINTC$:NEXTH
25 PRINTA$,"SHIP COUNT";C$
30 PRINT:PRINTA$,"BY J.FAWCETT"
35 FORH=1TO8:PRINTC$:NEXTH
36 PRINT"                  ▇PRESS SPACE■
37 GETBE$:IFBE$<>" "THEN37
40 PRINT"
100 REM
150 R=INT(RND(TI)*9)+1
200 PRINT"":FORS=1TOR:PRINTA$;:NEXT
210 FORT=1TO200:NEXTT
220 GOSUB500
300 PRINT"            ▇PRESS SPACE■
320 GETKL$:IFKL$<>" "THEN320
330 GOTO100
499 END
500 PRINT"▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇
510 PRINT"  |
511 PRINT"  |
512 PRINT"  |/‾\ /‾\ | |     |/\/\ /‾| |/‾\ |  |
513 PRINT"  |  | |  | | |     | | | | | |  | |  |
514 PRINT"  |  | \_/ |/\|     | | | \_| |  | \__|
515 PRINT"                                      |
516 PRINT"                                   \__|
520 GETQ$:IFQ$=""THEN520
530 IFASC(Q$)<49ORASC(Q$)>58THEN520
540 IFVAL(Q$)<>RTHEN800
600 PRINT"
601 PRINT"                         *
602 PRINT"                         *
603 PRINT"                         *
604 PRINT"                         *
605 PRINT"    *****   ***   ***   ***
606 PRINT"   *     * *   * *   * *   *
607 PRINT"   *     * *   * *   * *   *
608 PRINT"   *     * *   * *   * *   *
609 PRINT"    *****   ***   ***   ***
610 PRINT"         *
611 PRINT"         *
612 PRINT"   *     *
613 PRINT"    *****
619 FORSP=1TO5:PRINTC$:NEXTSP
630 GOTO1000
800 PRINT"▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇
801 PRINTC$;C$
803 PRINT"         |/‾\ /‾\                      "
804 PRINT"         |  | |  |                     "
805 PRINT"         |  | \_/                      "
806 PRINTC$
807 PRINT"           ▇PRESS SPACE■                  "
810 GETY$:IFY$<>" "THEN810
811 PRINT"▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇
812 FORSP=1TO5:PRINTC$:NEXTSP
820 PRINT"          LET'S COUNT THEM
825 FORY=1TO800:NEXTY
850 PRINT"▇":FORS=1TOR:PRINTB$;"████";S;:FORY=1TO 00:NEXTY:NEXTS
860 FORE=1TO600:NEXTE
870 GOTO200
1000 RETURN
```

NEWMAN COLLEGE SCHOOLS PROJECT The Project described in 'M-S 4' is now well under way. The following notes from one of the six schools show the enthusiasm generated. By the end of the summer we hope to be able to give a fuller account. 'MICRO-SCOPE' is eager to hear reports of other evaluation projects.

The machine was placed in each classroom for a week so that teachers and children would become familiar with the micro and would have a chance to experiment with the programmes available; also to use the micro in different teaching situations. The teachers in the school have been asked to keep notes on progress and problems and a simple questionnaire has been devised to assess the way the micro will best suit our class structures and our timetable. A simple handbook for teachers was devised to make operating the micro as simple and clear as possible.

A small group of parents was invited along one evening at 7 o'clock. We had two machines in school, the 480Z and a Video Genie which I brought in from home. After a brief twenty-minute introduction, the parents were given the opportunity to use the programs. Although the meeting was due to close at 8 o'clock, at 9 o'clock we were still working! We are beginning a computer club, with the help of several interested teachers. This will run each lunchtime and two evenings a week. The response from the children has been overwhelming, so much so that we are at the moment limiting the club to 4th years only. The aim of the club is twofold: to give the children a chance to follow up the work done in the classroom and to show some children the rudiments of programming. Obviously we had to request parental consent for the children to remain after school. To our surprise several parents asked if they could come along and join the children in the classroom.

A final project for this year is an attempt to make a video film of the development of the micro in the school. We hope this will give us an insight into how successful our integration programme is and also provide other schools with a chance of seeing the micro at work in the classroom.

If success can be judged on enthusiasm, then we feel we are on the right lines. We have not only had a response from parents and children. As a result of articles in the local press, two of our staff were invited to B.R.M.B. radio station to give a live interview on one of their phone-in programmes.

R. Butcher, Deputy Head,
Rounds Green Junior School, Oldbury.

COURSES AT NEWMAN

(Further details from Registrar.)

1) Diploma in Computer Applications to Education, 5-13 years

This is a one-year full-time Diploma commencing September 1982. The course concentrates on the microcomputer as a teaching aid, as applied to the primary age range.

2) Regional DES Course: Microcomputer Workshop for Primary Teachers.

This six day course (29,30 April, 7/14/24/25 May) is for primary teachers who already have an elementary knowledge of the potential of microcomputers. It is designed to enable participants to concentrate on the design and evaluation of software.

SOFTWARE

We have now updated the documentation booklet describing Newman College Primary Software (23 programs). The booklet gives user instructions and advice, but does not include program listings. Please send cheque or postal order for £1, payable to Newman College. The programs, which will only run on an RML 380Z or 480Z, are available free - just send 2 double sided discs (already formatted) or a C60 cassette. They will shortly be re-written for the BBC/Acorn machine. Please state which machine you intend to use. In return we would appreciate copies of any primary programs that may be suitable for our primary project. Further details from R. Keeling, Newman College.

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H·C·E