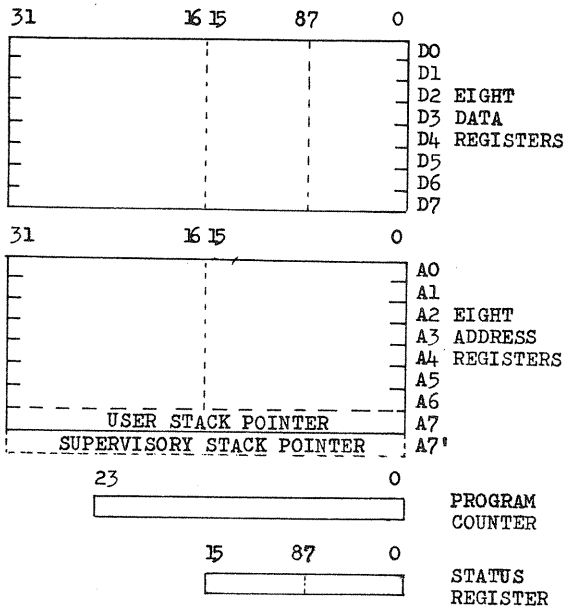


## 68000 Preview



The latest news about Motorola's next generation microprocessor gives the impression of a powerful and flexible device.

It will come in a 64 pin package, which allows the designers to provide separate address and data busses (23 and 16 bits wide respectively) as well as a useful range of control signals. The 23 bit address bus can handle 8M 16 bit words of memory; Upper & Lower Data Strobe signals define the individual bytes of a word which are affected.

Internally, the 68000 offers sixteen 32-bit registers as well as a 24-bit Program Counter and a 16-bit Status Register. The first 8 registers (D0-D7) are used for data registers for 8, 16 or 32 bit data according to the instruction. The second set of 8 registers (A0-A7) may be used as Stack Pointers or Base Address Registers, and may also be used for word (16-bit) and long word (32-bit) data operations; useful for address calculations.

Six basic data types are supported; Bits, BCD digits, ASCII characters, Bytes, Words and Long Words. Sensibly, most instructions can operate on Bytes, Words or Long Words.

Address modes provided include Register Direct (Data Register, Address Register or Status Register), Absolute addressing with either one or two words forming the address, Program Counter Relative; with Indexing if required, Immediate, and Register Indirect modes which allow post-increment or pre-decrement of the register contents, and offsets.

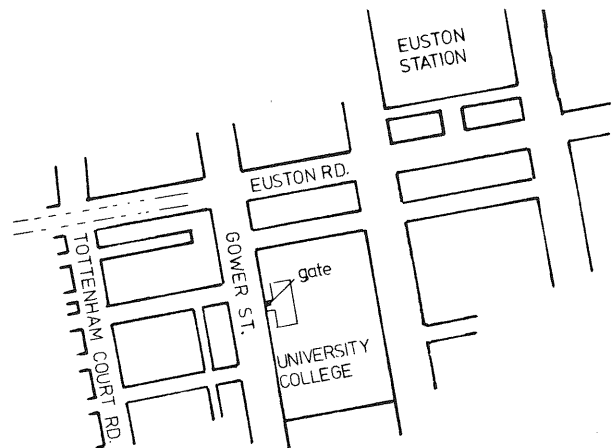
The regular structure of the 68000 should simplify Assembly Language program writing. Separate special instructions that operate on byte, word and long word integers are not necessary. The programmer merely has to remember one mnemonic for each type of operation and then specify data size, source addressing mode and destination addressing mode. Thus while the total number of instruction mnemonics for the 68000 has been kept to an easily remembered, yet complete, 61 types (11 fewer than for the 6800), combining instruction types, data types, and addressing modes, over 1000 useful instructions are provided. These include signed and unsigned multiply and divide, BCD arithmetic, and extended operations by a powerful 'trap' facility.

/.. cont on p2

## IN THIS ISSUE

- \* 68000 PREVIEW
- \* ELF TIMING PROGRAMS
- \* 77-68 32k RAM BOARD
- \* BAUDOT CODES
- \* ACC CONSTITUTION

## AGM; APRIL 5



### ACC ANNUAL GENERAL MEETING

Will be held from 7.00pm on Thursday 5th. April in the Nyholm Room of the University College of London, Gower St. (Enter through the gate on Gower St., go through the door on the far left corner of the quadrangle, and follow the signs.)

### AGENDA

- a) Retiring Officers' reports and statement of the Club's accounts.
- b) Election of Officers and Committee members for 1979/80.
- c) A.O.B.

## NEW MEMBERSHIPS

We have not included a 1979/80 membership application form with this newsletter (the last of Vol 6) because of problems associated with computerisation of the membership records (a likely excuse!) and the fact that as yet we don't have anyone to handle membership applications for 1979/80. However, rest assured that as soon as these problems are solved, Galdor's Ahmdahl will swing into action and appeals for your money will be broadcast.

In order to improve the speed of loop operations, a single word instruction for Decrement Count by One and Branch if non-zero (DCNT) is included and several single word instructions such as Add and Subtract include 8 bit immediate data for fast small value arithmetic operations on data registers and memory. A powerful MOVE instruction has been incorporated that allows the transfer of bytes, words and long words and operates in all addressing modes. Thus register-to-register, register-to-memory, memory-to-register and memory to-memory transfers are permitted.

LINK and UNLINK instructions reduce subroutine call overhead when implementing high-level languages by allowing the manipulation of linked lists of data areas on the stack, while Store Multiple Register and Load Multiple Register instructions also simplify subroutine handling.

A vectored priority interrupt structure is provided with 192 vector locations and eight maskable levels of priority, and sixteen software trap vectors for use with the TRAP instruction will be useful in operating system routines or user generated 'macro routines'.

The 68000 may be run in 'User' or 'Supervisor' modes, the latter mode allowing certain protected operations such as, for example, to update an external memory management device. A 'Trace Mode', which is available to the programmer in both User and Supervisor states but can only be entered while in the Supervisor mode, allows instruction by instruction tracing of a program being debugged by 'trapping' to a tracing routine after each instruction execution.

Finally, the 68000 requires only a single phase TTL clock input, and a single (5V) power supply. The bus is asynchronous, allowing the mixing of slow and fast memories or peripherals while automatically optimising the transfer rate on every access to keep the system operating at peak efficiency.

## ELFISH LOOPS

### ELF TIMING PROGRAMMES

The Cosmac Elf uses the RCA 1802 microprocessor. One of its advantages for the home computer user is the provision of a 1 bit O/P known as Q. There are a group of instructions in the instruction set which allows setting and resetting of Q, also the ability to test its condition and jump accordingly. Thus it is possible to write programs to obtain pulses of required width and frequency.

The following programs give suggested listings and formulae for various timings and frequencies. Note that a machine cycle is eight clock periods.

#### Program 1 (for High Frequency)

SET Q	EXAMPLE	MACHINE CYCLES USED
DELAY	7B	2
RESET Q	7B	2
DELAY	C4	3
JUMP	7A	2
	C4	3
	3000	2
		<hr/>
		14

Total machine cycles = 14

$$\text{PERIOD} = 8 \times 14 \times \frac{1}{f_c} \text{ us} \quad \text{where } f_c \text{ is in MHz}$$

$$\text{PRF} = \frac{f_c}{8 \times 14} = \frac{f_c}{120}$$

Thus if  $f_c = 2 \text{ MHz}$  the  $\text{PRF} = 17.86 \text{ KHz}$

NOTE : The extra 7B instruction balance the on and off times to provide a square wave.

### 77-68 32k BYTE DYNAMIC RAM BOARD

Well at last its happened ! This board uses the low cost 4116 which also has the great advantage of low power consumption. One or two novel features have been included;

- 1) 16x baud rates have been brought out to help any 6850 ACIA's which might be lurking on other boards.
- 2) If the chip selects of PROM, I/O chips are applied to this board ROM & RAM can be mixed in the same area. e.g. 64k bytes comes to the 77-68 !

The boards are now available with the usual ACC discount from Newbear, 7 Bone Lane, Newbury.

Tim Moore

## LIBRARIES

### GENERAL LIBRARIAN WANTED

Frank Cato, who has run the ACC General Library so well, has now to relinquish the post because of an impending world cruise, and is searching for a replacement. Volunteers please get in touch with Frank as soon as possible at 3 Rykneld Way, Derby, DE3 7AT tel; 0332 513769.

May I take this opportunity to thank Frank for all the hard work he has put in on behalf of the ACC, and especially for his infectious enthusiasm for things computing.

Mike Lord

### 6800 HARDWARE LIBRARY NOW HAS 326 ITEMS

Send A4 sae & 35p stamps to Bob Forster, 18A The Barons, St.Margarets, Twickenham, Middx

#### Program 2

#### CYCLES USED

SET Q	←	2	
SET Q		2	
LD N	D	2	
DEC D	←	2)	= 4N
JUMP TILL ZERO	→	2)	
RESET Q		2	
LD N	D	2	
DEC D	←	2)	= 4N
JUMP TILL ZERO	→	2)	
JUMP		2	
			<hr/>
			12 + 8N

$$\text{PERIOD} = (12 + 8N) \times \frac{1}{f_c} \text{ us}$$

where  $f_c$  is in MHz

$$\text{So PRF} = \frac{f_c}{96 + 64N}$$

Example - if  $f_c = 2 \text{ MHz}$ ,  $N = 6$   
 $f = 5.68 \text{ KHz}$

Using the above example it is possible to obtain any timing required especially if some of the other registers are used.

May I make a plea to people who produce programmes and publish them in the Newsletter and other magazines. A considerable section of those who read these articles are not professional programmers (like me), so one of the most useful aids for them is a flow chart, if possible the line numbers or addresses against each block.

This provision greatly aids comprehension and, where necessary, transcription to another processor.

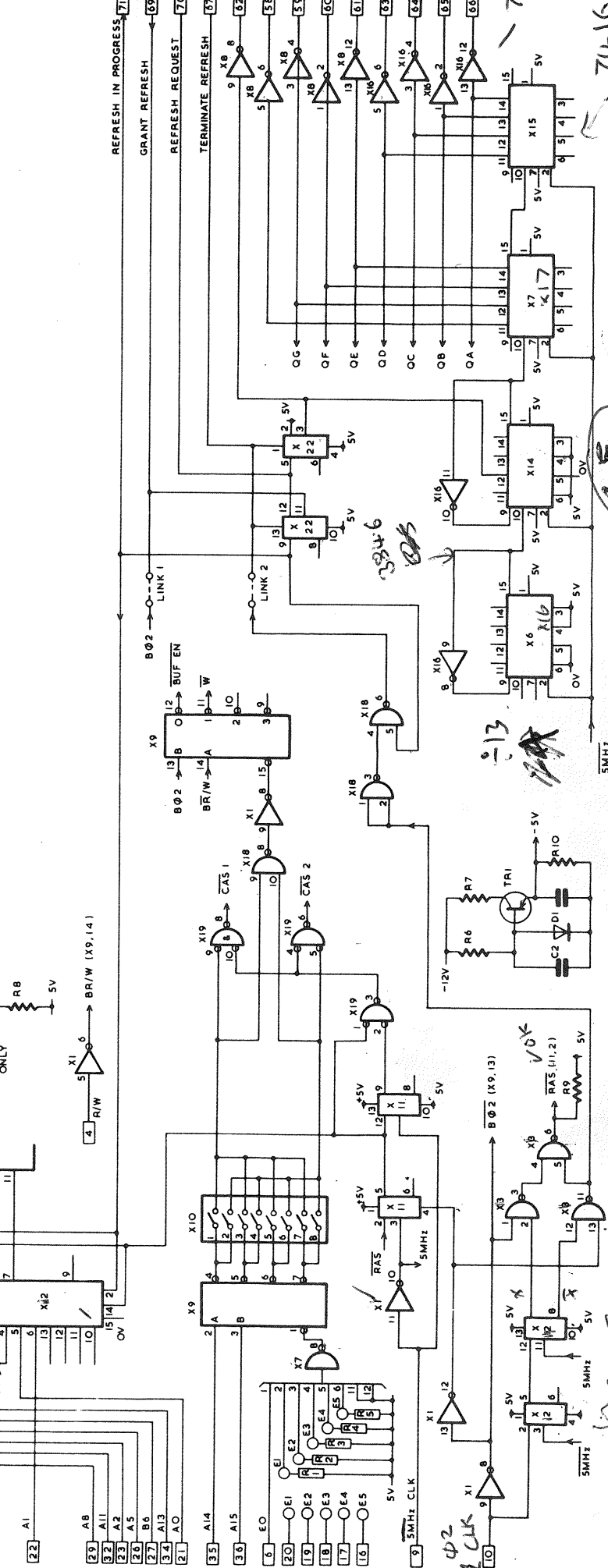
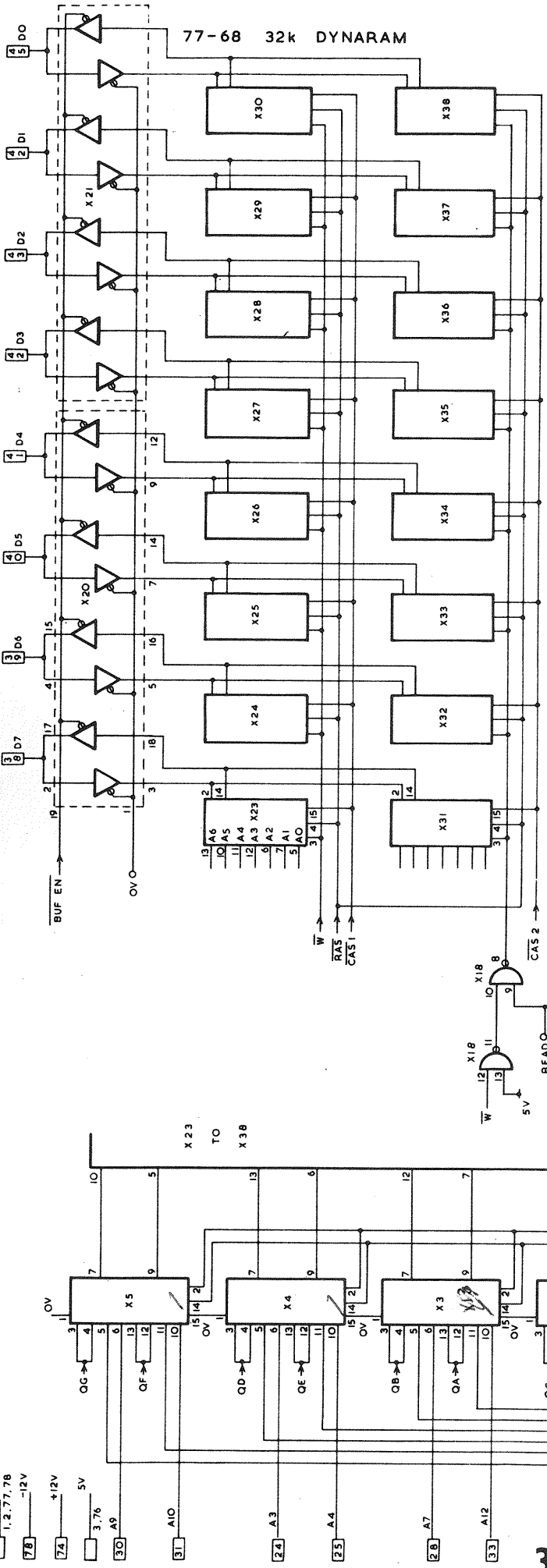
J. CUNNINGHAM



New Bear Computing Store  
© 1978 ISS. 1

Handwritten initials: *PJ*

Handwritten notes:  
(Board R/C)  
(48,000)  
76.92MHz  
38.46 2400x  
1923 12,001  
600  
300  
150  
75  
37.5  
18.75



Handwritten number: 74161

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Handwritten number: 13

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## CONSTITUTION OF THE ACC

As revised and agreed at the AGM of 13 April 1978

- 1) The Club shall be known as the Amateur Computer Club.
- 2) The aims of the Club are to promote and co-ordinate interest in the design, construction or programming of computers and allied equipment.
- 3) Membership of the Club shall be open to anyone subject to;
  - a) The approval of the ACC committee, who have the right to reject any application for membership.
  - b) Payment of the annual membership fee.
- 4) The membership fee shall be £2 per annum except for members who are resident in the UK and who are also 16 years of age or under on the 1st. April, in which case a reduced fee of £1 shall be allowed.
- 5) The membership fee shall only be changed by resolution at a general meeting.
- 6) Membership shall last from April 1st until March 31st of the following year.
- 7) The committee of the Club shall consist of not more than 5 officers and not more than 10 other committee members, all of which are honorary appointments.
- 8) Any member of the ACC is eligible for election to the committee, provided that he or she is proposed and seconded by two other ACC members.
- 9) Officers of the committee must be 18 years of age or older.
- 10) Elections for officers and committee members shall be held at the AGM.
- 11) The activities of the Club shall be coordinated by the committee in accordance with the constitution.
- 12) All resolutions shall be carried by a simple majority of those present and voting. In the case of a tie the Chairman has the casting vote.
- 13) All general meetings shall be held within 10 miles of the centre of London.
- 14) Notice for any general meeting shall be sent to members of the Club not later than 2 weeks before the date of the meeting.
- 15) An extra-ordinary general meeting may be called by 10 members provided that they give 6 weeks notice to the Chairman and pay any costs incurred in informing all Club members of the proposed meeting, and also the costs of the meeting.
- 16) At any general meeting a quorum shall consist of 10 members, including 3 members of the committee, at least one of who shall be an officer.
- 17) A resolution for the dissolution of the Club shall require a three quarters majority as a result of a postal ballot of all current members. Any assets of the Club remaining on dissolution shall be donated to the British Red Cross Society.
- 18) The address for all communications to the Club shall be 7 Dordells, Basildon, Essex.
- 19) A resolution to change this constitution shall only be approved at a general meeting.

## LETTERS

### VDU HELP WANTED

Wanted; circuit diagrams for Cossor VDU type 4(2-2A-C18 (I already have a manual for an earlier type). Denis Bunker 3 The Row, Hawridge, Chesham, Bucks.

### Z80 ASSEMBLER SOURCE LISTING

Since Byte published my Z80 Assembler program as No. 101 of their Nybbles Library (see December '78 Byte p.92) I have received many requests to provide the listing direct. Owing to the size of the listing this is not proved practical, but I have spoken to L.P. Enterprises who say that they will stock the program at a price of about £4 (check with them for exact price and availability). For those who didn't see the announcement here are some brief details. The program assembles all the original Zilog mnemonics and pseudo-operations except for macros and conditional assembly. It occupies about 7k of memory. The user provides his own I/O routines, which are similar to the Intel or Zapple monitor calls.

Pat Crowe

### HAS ATARI BEEN MODIFIED ??

Have any members modified the ATARI VIDEO COMPUTER SYSTEM for use as a home system, if so I would be grateful for any advice they can give. Mr. G. Bramwell, Phillips Service, 12 Stocks St., Manchester 8

### CAN PET & KIM COMMUNICATE ?

How does one go about interfacing a PET with a KIM board (or 2/3 KIM boards for that matter in parallel) so that they can all talk and listen to each other, with PET acting as master ?  
L. Willer 22 Wilton Grove, Wimbledon SW19 3QX  
tel 01 542 2851

### LETTER FROM THE CHAIRMAN

Readers will have read elsewhere in the Newsletter a notice advising the time and venue of the 1979 AGM. I feel it is now time for me to put some questions and comments to the membership as a whole.

The AGM is the time when the retiring officers and committee make their reports and, if they wish, offer themselves for re-election. It is also the time and place for the membership to make their thoughts on the club known, and what direction it should take in the future.

One of the points to be considered is what form the Newsletter should take now that the popular magazines have become available. It should be noted that to the majority of the members the Newsletter and associated hard/software libraries is the whole being of the club. It is not set up to do any more. This is as much as the £2.00 subscription will pay for and if the facilities of the club are to be improved, then almost certainly the subscription will have to be increased.

With the resignation of Mike Lord as both Newsletter Editor and Treasurer it is now necessary for us to elect a new Editor. This ideally needs someone with some journalistic experience, but remember that Mike is not a journalist and he managed very well, so really all it needs is someone with a certain amount of enthusiasm to collate the articles together and send them to the printers. Would those interested please contact any Officer of the club.

Another Officer of the club to be elected is the Treasurer. One nomination has been received, so all you budding accountants how about you having a go?!

A suggestion has been made that the club should be organised in the same way as the RSGB. For those who are unfamiliar with the RSGB I should explain that the RSGB is organised in a pyramidal structure with a Head Office in London and the country split into regions with elected regional representatives resident in each.

The regional reps. report to the Head Office. Thus any member can make suggestions, complaints, etc, to the regional representative who will then forward them to the Head Office. In this way the Head Office is not a nebulous mass in London from which only comes the magazine and the requests for increased subscriptions, but is reachable within a local area.

Although this structure could be considered rather weighty at the present, it would be a boon once the membership increases to the 3,000 mark. It would then be rather difficult for the officers and committee of the club to keep up with the workload which would result. After all one can only expect the membership to continue increasing and I personally expect that the limit will be about the 3 - 4 thousand mark. After that losses and new members will average out.

Another problem which has been apparent for the past year is due to the rapid rate of growth of the club. The club is still organised for a membership of about 500. Thus with the numbers at the present level and which is almost certain to increase, it is necessary for the organisation to be changed to accommodate the numbers. A step in the right direction has been taken with the use of a computer bureau for the membership lists and address label printing. Also to be taken into account is the actual mailing of the Newsletter and I feel that this should really be handled by a professional mailing agency. The ideal is to ensure that no officer or committee member feels any strain while performing his duties. Thus there does come a time when either paid help is required or extra members co-opted onto the committee to assist. This is a decision which will have to be made at the AGM.

Certain members from the Midlands have complained at the occasional meetings and various functions they have attended that the club is too London orientated. The reason for this is that all the officers and committee members live in the London area. There is only one simple solution to this comment and that is for them to come down to the AGMs, make known their views, join the committee and then act as their area representative. This will then gradually bring the centre of gravity of the club further North and will effectively answer their complaints.

I wish to point out that we cannot solve problems if we do not hear or read them so I would like to see you at the AGM or failing that a letter to me. Perhaps local groups could send a representative to the AGM?

May I express my thanks to the Secretary, Editor/Treasurer and committee members for the excellent work which all have put in this year.

PLEASE REMEMBER YOU ONLY GET OUT OF THE CLUB WHAT YOU PUT IN!!

#### WHERE TO INDEED ?

I have read with mixed interest and dismay the suggestions offered by Alan Secker in the October newsletter, in which he describes a complicated system of committees and sub committees interacting with local groups, yet without any convincing statement of what it is all for. To speak of the ACC 'pushing the industry' seems optimistic, to say the least, especially considering the importance of the activity in the USA.

A question I would like to see carefully answered is 'what exactly IS a local group ?' I am secretary of a newly formed group called the North Kent Amateur Computer Club. I was a little worried about that name, as I couldn't think of a single respect in which this seeming association with the ACC would make any difference. If we went 'independant', changing our name accordingly, what else would change ? We decided at our inaugural meeting not to insist that all of our members should join the ACC. Naturally, many of them have, but we have avoided placing this extra financial burden on the others, and perhaps we have gained a few extra members as a result. If the question should ever arise of voting within the group, for representation of our views to the ACC, then it would be easy enough to restrict voting to ACC members present.

Regarding exhibitions, I am inclined to agree with Mr Secker, though I understand that the problem is mainly due to lack of exhibition space. For example, I would gladly have lent my own system, complete, which would surely have been 'splendid' enough, but because of space limitations had to exhibit only the main board. However, I think that this point can be and should be generalised. Arguably, the mere presence of the ACC at a computer show is all that is necessary. The people who really need to be contacted are the general public. I still meet people who are amazed to learn that I have two computers in the home. How can I justify this extravagance ? What do they DO ? People who smile at the suggestion that they too should have a home computer for the sake of their childrens education. Perhaps the ACC should be trying to break this public image of computing; exhibiting at NON-computing shows, presenting at local schools, writing in local papers etc. This would be something for those committees to get their teeth into, and for the local groups to actually execute.

Barry J Biddles

#### SOME 5-LEVEL BAUDOT CODES

BIT CODE					Lower Case	Upper Case			
						CCITT	Commercial	AT & T	Weather
1	1	0	0	0	A	-	-	-	-
1	0	0	1	1	B	?	?	5/8	⊕
0	1	1	1	0	C	:	:	1/8	⊙
1	0	0	1	0	D	Who are you?	\$	\$	/
1	0	0	0	0	E	3	3	3	3
1	0	1	1	0	F		!	1/4	—
0	1	0	1	1	G		&	&	\
0	0	1	0	1	H		#		
0	1	1	0	0	I	8-	8	8	8
1	1	0	1	0	J	Bell	Bell		/
1	1	1	1	0	K	(	(	1/2	—
0	1	0	0	1	L	)	)	3/4	\
0	0	1	1	1	M	.	.	.	.
0	0	1	1	0	N	,	,	7/8	⊕
0	0	0	1	1	O	9	9	9	9
0	1	1	0	1	P	0	0	0	⊙
1	1	1	0	0	Q	1	1	1	1
0	1	0	1	0	R	4	4	4	4
1	0	1	0	0	S			Bell	Bell
0	0	0	0	1	T	5	5	5	5
1	1	1	0	0	U	7	7	7	7
0	1	1	1	1	V	:	:	3/8	⊙
1	1	0	0	1	W	2	2	2	2
1	0	1	1	1	X	/	/	/	/
1	0	1	0	1	Y	6	6	6	6
1	0	0	0	1	Z	+	+	+	+
0	0	0	0	0		Blank			-
1	1	1	1	1		Letters shift			
1	1	0	1	1		Figures shift			
0	0	1	0	0		Space			■
0	0	0	1	0		Carriage return			<
0	1	0	0	0		Line feed			≡

## Shop

### CASIO FOR SALE

Casio Pro FXI Programmable Calculator, complete with mains unit, manual and program cards. Phone Medway (0634) 65539 weekends or evenings after 7.00pm. £70 ono. J.Langdon-Shreeve

### MICRO MICRO WANTED

Simple micro with hex keyboard and output e.g. KIM with or without accessories. A.J.S.McMillan, 18 Torridge Rd., Keynsham, Bristol BS18 1QQ tel; 02756 2120

### PRINTER WANTED

Has anyone a line operable i.e. serial or parallel binary addressible IBM Golfball or similar typewriter in any reasonably repairable condition and of course at a reasonable price ?  
W Brown, Ghyll Crest, Cansiron Lane, Ashurst Wood, East Grinstead, Sussex

### MK-14 FOR SALE

Science of Cambridge Mark 14 microprocessor with extra RAM, RAM I/O device, cassette tape interface, revised latest monitor, 2N425E D/A chip for music, edge connectors, separate keyboard. All documentation. Cost £84, price £55 post paid. Michealson, 01 4558831

### S-100 BITS FOR SALE

Cromemco Bytesaver II (assembled) 2708 Eprom programmer £105 ono

Cromemco 16k PROM (2708) card assembled £105 ono

Cromemco TU-ART (2 ser. + 2 par.) interface, assembled £145 ono

Imesai 8080 22 position M/Board (new, bare) and CPU board kit; Offers

P Chamberlain 10 Marl Hurst, Edenbridge, Kent tel 0732 863600

### COMPLETE SYSTEM FOR SALE ( OR WILL SPLIT)

SWTPC-68 modified to MSI-6800 standards (16 slot motherboard, heavy duty power supply) with SWTBUG, 24k RAM, MP-S £830

Newbear VDU 16x64 + lower case £260

Percom disc driver & 2 mini-disc with software in EPROM £675

Cassette I/O interface £70

ROM programmer (2708/2716) £30

Extra interfaces ; MP-L £30, MP-S £30

IBM 3982 golfball printer (heavy duty computer output) 132 character, upper & lower case with interface for SWTPC-68 £330

Total of above; £2255, job lot price £2100

All relevant manuals supplied, some software available, choice of DOS.

M.T.Rowat Braeside, Clarach Rd., Borth, Aberystwyth, Dyfed, SY24 5LP

### 77-68 FOR SALE

77-68, CPU card, built working in case with PSU, front panel LED's & switches, backplane + 2 edge connectors (with room for many more), also copy of Scelbi 6800 Software Gourmet Guide. Buyer can also have hex keyboard and proto PCB. Tel Bob Buttery 0536 3154 £60 o.n.o.

## Meeting Points

### HOBBY COMPUTER CLUB OF HOLLAND

For details write to; Rob van Spaandonk, Pelikaanhof 165, 2312 EJ Leiden

### SOUTHAMPTON ACC

Is holding a grand Z80 Gala on Wednesday 2nd May, not to be missed, bring your Z80 system, speakers will include Peter Greenhough from Nasco. Further information may be obtained from P.G.Dorey, School of Biochemical & Physiological Sciences, University of Southampton, SO9 5NH

### POOLE & BOURNEMOUTH

For details of the newly-formed Poole Home Computer Club write to Robbin Pink, Flat 3, 43 Lindsay Rd., Branksome, Poole

### KETTERING CLUB KREATED

Anyone interested in joining the newly formed club in Kettering should get in touch with R.Buttery, 55 Northumberland Rd., Kettering, Northants, NN15 6LN

### BRISTOL COMPUTING CLUB

Are now holding regular meetings on the third Wednesday of each month. Anyone interested can obtain the current time and place of meetings by sending a SAE to the chairman; Mr. L.Wallace, 6 Kilbernie Rd., Bridge Farm Estate, Bristol BS14 0HY

### NORTH KENT ACC

Generally meets on the second Tuesday of each month at Charles Darwin School, Jail Lane, Biggin Hill. Recent meeting have included a Z80 evening, and an interesting lecture by Bill Strang of Sira. The club secretary is Barry Biddles, 3 Acer Rd., Biggin Hill, Kent. tel Biggin Hill 71742

### SOUTH WEST LONDON GROUP TO BE FORMED

Would anyone interested in starting a group in the Richmond (Surrey) area please contact Bob Forster 18A The Barons, St.Margarets, Twickenham, Middx. tel 01 892 1873

### AND WHAT ABOUT ESSEX

Anyone interested in forming a group in the South Essex area ?  
Mike Lord

### NO GARBAGE FROM GALDOR

Readers may be interested to know that the ACC Newsletter mailing list & labels are now produced by Galdor Computing (01-399-1300). Their current configuration includes a 128k ICL 1905F running George III with a 24-02 which was used to generate the membership list sent out with the last newsletter. But-as always with Galdor - enhancements are under way.

### AMATEUR COMPUTER CLUB NEWSLETTER

Vol 6 Iss 6 February 1979

Editor; Mike Lord

7 Dordells, Basildon, Essex  
tel; 0268 411125 (evenings)