A.C.C NEWSLETTER VOL 3 1SS I APR 75

SPRECHEN SIE ?

COMPUTER TRANSLATION OF SPOKEN LANGUAGES

I am the author of an unpublished paper entitled 'Spoken Languages Universal Numeric Translation' (SLUNT) which explains a method of language translation by computer not tried by other researchers. All SLUNT translations take place through the medium of a specially invented intermediate language consisting entirely of numerals and called Number Language. SLUNT can be used for all spoken languages®

A package is available which translates simple English sentences into German. The programs not only carry out the translations, but also provide detailed explanations of the programming methods, which can be adapted for more complex sentences or for other spoken languages. The programming language used is SLUNT COBOL, a very elementary subset of COBOL, which can easily be adapted for any digital computer.

SLUNT research is particularly well suited as a hobby for computer hams, having been invented by one. Various commercial firms have allowed me free computer time for testing and running programs, and this has been fitted in whenever their own work would not suffer by it. I have done all punching myself.

I visualise programmers in a number of different countries writing programs for translating simple sentences from their own language into Number Language and from Number Language into their own language. Messages are then sent in Number Language. After a number of simple programs have been written, Computer Pen Friend correspondences can begin.

I shall be glad to supply a copy of my paper to anyone interested. SLUNT researchers are needed in every country.

Walter Goshawke
68 Barrington Rd., Bexleyheath
Kent DA7 4UW

NEW MEET

ACC COMMITTEE MEETING

(All ACC members welcome)

Thursday May 15 7.30pm
Computer Room, 3rd floor,
Polytechnic of South Bank, London

CHEAP I/C, TTL & MOS MEMORY

From International Electronics Unlimited PO Box 1708 Monterey CA 93940 USA (see Practical Electronics, April)
74181 @ £2.50 2102 @ £3.81

OLD MEET

REPORT ON THE 2nd AGM OF THE ACC

Thursday March 20 1975 at the Polytechnic of the South Bank, London SE1

The chairman, Mr.J.Creutzberg, opened the AGM with 19 members present.

The chairman asked for retiring officers' reports for the year ending March 1975.

The Treasurer, Mr.M.Lord, reported that the club had 282 members in 1974/5 and a current balance in hand of £52.37

The secretary, Mr.J.Aslett, reported that there were 4 ACC club meetings during the year the most successful being at Digital Equipment Ltd at Reading with over 40 members attending. Two committee meetings were held during the year. The ACC had also received extensive national publicity in aid of its membership drive.

The existing officers and committee members then formally retired and Mr.J Creutzberg asked for nominations for chairman.

Mr.J.Creutzberg was returned unaposed as chairman.

The chairman then asked for nominations for treasurer and Mr.M.Lord was returned unaposed.

The chairman proceeded with nominations for club secretary and Mr.J.Aslet was returned unaposed.

After asking for nominations for committee members the following were proposed and elected en bloc;

Mr® Ian Richardson
Mr. Tony Jones
Mr. Mick Reeve
Mr. Mick Kirby

The chairman then moved discussion to the subject of special project topics for 1975. The following were agreed;

Software Language Translator
Members questionaire
ACC design of a low cost computer

A possible lecture/visit programme was discussed and the following suggestions made;

visit to IBM training cantre - London
computer music lab - London
computer resale brokers warehouse

Under AOB Mike Lord raised the topic of the number of ACC newsletters in a year. Kike said that due to increased postal rates and the need to hold membership fees members might feel that a reduction in number from 6 to 5 newsletters might be made with an increase in the size of the remeining issues.

After further discussions the resolution "that the ACC newsletter will remain at 6 issues" was passed unanimously.

- Mick Reeve was requested to co-ordinate information and publicity for schools which were thought to be a major area for ACC membership growth.

The chairman raised the question of having a central facility in the ACC to store old computer manuals and other documentation for reference purposes. However after discussion no solution was reached and the matter was deferred.

After thanking all those members who attended the chairman closed the AGM at 9.35pm.

Jon Aslett
secretary

SORRY

But since we announced the cheaper, seeond source 8008 (see v2, I6, p8) the manufacturers - Microsystems International Ltd - have decided to close down their manufacturing activities.

LETTERS

DATA

With reference to the Feb newsletter;

a) Page 4 letter from C.Gill on Mullard core. ICL used a similar stack in 1901,2 systems (called 1941 Core Store) Actual ICL type was Mullard AW663.

b) Comment on page 7 on a communal machine is very appealing. I'm an enginer but no designer and the finer points of 'pull-up' resistor loads are a little beyond me. I've got ideas on an instruction set but to convert to real hardware is proving extremely slow. I'm all for a communal unit; don't the industry papers always say "User Groups Prosper".

My firm maintains computers, old & new and has a wealth of knowledge which could be accessed if the correct questions are asked. All equipment is manufacturer built not home grown so the gen may not be applicable but I'll try to help, particularly on obsolete kit now for sale cheap - eg ICL 1901,2,3 LEO Elliott etc.

I.Paterson
19 Melbourne Close
Stotfold, Hitchin,
Herts SG5 4LB

WANTED

ASR 33 or similar 8 level device, paper tape reader, asynchronous Modem (any speed) wanted at reasonable price.
I would collect in West Germany, Holland or Belgium & could probably arrange collection in the south of England*

I.Spencer 5353 Mechernich
Am-Museum 3 , West Germany

HELP

Anyone know the motor start circuit for 110 V AC FRIDEN Flexowriter ?

M.Lord

ACCPROC

ACC SYSTEM 1 (A family of club machines)

One of the main talking points of the AGM was the design of a club machine® An obvious problem was the cost; how much could the average member afford ? It was suggested that the club design a simple, slow eight bit processor, which would thus fall within the range of all pockets. Why not design a family of machines which share a common instruction set, but have different operating speeds (and hence cost)? Thus a member could choose which particular model of the family he built according to his finances, but still share software with other members whether they were able to afford faster or slower models than himself.

The following describes the instruction set and basic architecture of such a system, ACC System 1 for want of a better name;

The basic word length is one byte (8bits) Data may be manipulated by the adder as 8 bit binary ?/ords or two BCD digits.

Instructions which reference a location in store are 3 bytes in length, the last two bytes giving the address, thus the system may directly access 65K of store. There are two basic modes of address;

a) Absolute - bytes *2* & 3 of the instruction give the address®
b) Indexed - the value in general purpose reg 7 is added to bytes 2 & 3 to give the address.

Each mode may be used to give a direct or indirect (deferred) address, thus a store location may be addressed in one of 4 ways®

There are 8 general purpose registers available to the programmer; 0 thru 7® Instructions addressing these registers & I/O instructions are tv/o bytes in length. Reg 7 is used as the index register and all programmed IO takes place through Reg O.

A ninth reg, the condition code reg, may be tested and set by the programmer, although it is also accessed by the hardware. It contains the link bit (L), the binary overflow bit (B) and the decimal overflow bit (D). The L bit is set to the state of the carry out of the MSB of the ALU during ADD instructions. During SHIFT instructions the L bit and the specified reg are treated as a 9 bit operand, the L bit being considered as the MSB. The B bit is set when the carry out of the MSB of the ALU and the MSB (bit 0) are not the same, thus indicating overflow during signed binary operations. The D bit indicates overflow during signed BCD operations.

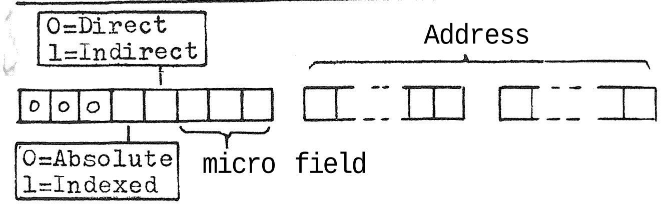
System control instructions (eg HALT) are one byte in length.

Registers

PC	Program Counter	(16 bits)
SAR	Store address reg	(16 bits)
SDR	Store data reg	(8 bits)
CCR	Condition code reg	(3 bits)
BSR	Branch & skip reg	(1 bit)*
ISR	Instruction reg	(16 bits)*
0 thru 7	general purpose reg 0 = programmed IO reg 7 = Index reg	(8 bits)

* hardware only

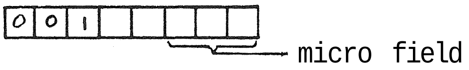
Jump (Housekeeping) Instructions



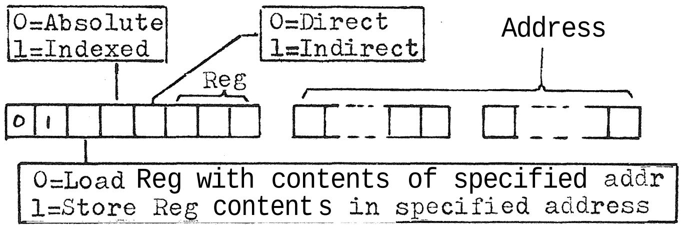
JMP	Unconditional Jump
JMS	Jump to Subroutine (save return address)
JSW	Jump to specified address if sense switch set

System Instructions

STP	Stop
IDL	Idle (wait for interrupt)
NOP	No Operation (1 cycle delay)



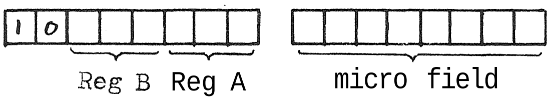
Memory/Register Instructions


0=Absolute
1=Indexed
0=Direct
1=Indirect
Address
Reg
0 1
0=Load Reg with contents of specified addr
1=Store Reg contents in specified address

Register/Register Instructions

AND	A.B	Result to A
IOR	A+B	"
XOR	A⊕B	"
BAD	AplusB Binary	
DAD	AplusB Decimal	
SAE	Skip next instr if A=B	
SAG	" " " " A>B	
SAL	" " " " A<B	

Several instructions may be programmed together i.e. setting the SAE & SAG bits on will skip if A≥B



Register Instructions

Group 0

CLR	Clear Reg
CMR	Complement Reg
SRR	Shift Reg & Link Right
SRL	Shift Reg & Link Left
SER	Set Reg
TCR	Two's Complement Reg
NCR	Nine's Complement Reg
INR	Increment Reg

Group 1

SGO	Skip next instruction if Reg>0
SLO	<0
SEO	=0
SNO	≠0
SRO	odd
SRE	even
SKP	Unconditional skip

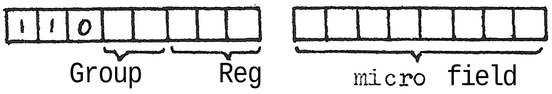
Group 2

Bits 0&1; 00 L bit
01 B bit
10 D bit

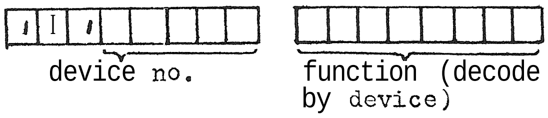
SBO	Skip if specified bit =0
SBN	≠0
ABB	Add bit to LSB (Binary)
ABD	" " " " (Decimal)
CLB	Clear specified bit
CMB	Complement specified bit

Group 3

LDI	Load immediate (Load second byte into specified reg)



I/O Instructions



1 am currently designing the hardware for a fairly fast parallel version of the system. Perhaps ACC members would like to comment on the instruction set from a software point of view, or design other models (e.g. low cost, slow speed,serial or medium cost, medium speed versions.)

Mick Reeve

CCD serial-memory

CHARGE-COUPLED DEVICES, WHAT ARE THEY ?

Storage devices that look like shift registers - but at each stage information is represented by an electric charge rather than by the state of a bistable. By some clever scheme (of which I know nothing - perhaps some other ACC member could throw some light on this) clock pulses persuade the individual charges to progress in an orderly manner from the input of the device to the output. If left to itself the charges will of course eventually dissapear, so the clock pulses have to be at greater than a specified minumum rate - like a dynamic RAM.

Big future is seen as disc/drum replacement (CCD's are too slow to replace main memory but 100-1000 times faster than disc/drum and hopefully about the same price) and as CRT display refresh stores. Intel have shown a developmental 9 x 15in board which stores 128Kbytes (equivalent to fixed head disc or drum)

Now available from INTEL & FAIRCHILD, but wait a bit- prices are rather high at the moment but should drop considerably over the next year.

Fairchild I/C (CCD450) is organised as 1024 words, 9 bits® Average access time 200uS, 18 pin DIP.

Intel device (2416) has 16384 bits internally organised as 64 256 bit shift registers giving average access time of less than 100uS. 18 or 22 pin DIP.

ED'S BIT

THE WEENY BITTER

Fair amount of interest generated by the proposal for a 'communal' design of a basic computer in the last issue of the ACCN - see for example page 2 of this issue - and it was formally adopted as a club project at the AGM, so to get down to the nitty-gritty I'd like to make the following proposals (but feel free to disagree);-

1.Organisation of the design work

Will take too long if we communicate only through the newsletter so in-between issues I'll copy & pass ideas around all those willing to contribute (please don't use blue ink, it doesn't photo-copy well, and a few stamps would come in handy).

A 'State of the Art' report will be printed in the June issue.

We must aim to freeze the instruction set in time for the August issue - any longer than that and we'll never get started. This will then let the software people get on with programs, emulators, cross-assemblers etc* The basic hardware design should also be complete by that time.

One most important point, as the ACC as a club will not actually be building a machine we need some member(s) to agree that they will build early model(s) of the beast.

2. Purpose of the Thing

- to demonstrate hardware & software principals.
- to be used to practics basic programming techniques.
- to provide a (relatively) painless introduction to computer construction.

Elaborating on the last point, I have the feeling that when someone starts to think about building a computer his thoughts run somewhat as follows;- " I'll have an ASR33, v/ith perhaps high speed paper tape reader/punch . . . a VDU would come in handy, & I need at least 2 big mag tape drives for a backing store . . . *now* the CPU . . don't want one of those cheap microcomputer chips, surely I can design something much better myself . . . 16 or 24 bits is a nice word length but better watch the cost so make it 16 . . . need at least 8K bytes of main store, preferably 16K * . . . anything slower than 5uS cycle time isn't modern so I'd better make it a parallel CPU • . . comprehensive instruction set of course, word & byte handling, stack addressing seems to be all the rage, plus stack relative, absolute, indexed, program relative - all of them both direct and indirect ...."

Then the would-be constructor gets depressed when he realises that it will take at least a year and several hundred pounds before he has anything that shows any signs of life.lt should be possible, however, to build the proposed machine in a few weeks and as well as being a good toy in its own right (and remember that some commercial machines only have ½K core) can form the basis for future work.

The way I could see it going is;-

a) build simple CPU
b) add simple peripherals
c) modify tape cassette recorder to act as backing store
d) add more high speed memory
e) get better peripherals
f) build better CPU, keeping old one as say a buffer processor to interface VDU

3. Design Parameters

- cost must be less than £50, allowing £15 for power supply, case & misc hardware leaves £35 for the 'works'.
- must be able to be built and tested using only a simple multimeter (think that rules out the use of dynamic RAM)
- no single IC should cost more than £5
- straightforward and easy to understand instruction set.
- don't think that it should be designed as part of a 'set' of ACC machines - this approach could lead to some pretty tortuous compromises .
- 8 bit word.
- minumum 128 words.
- an 8 bit word can only address 256 words of memory, anything more than that calls for multiple word addresses which make life very difficult. A 256 word limit on the main memory would be OK if we could work out some way of being able to have more high speed memory useable, perhaps as some form of secondary store?
- power unit & case should allow for a (moderate) amount of expansion.

QUESTIONS - QUESTIONS

Should be a questionnaire with this newsletter, would you please complete it and return if possible by raid May at the latest.

We then propose to unleash the full might of Jon's 1500 on the answers and so generate piles of statistics to guide us in the running of the ACC.

LIBRARY

C.Rowley has kindly sent copies of two articles from the American magazine 'Radio-Electronics'. They are;

TV TYPEWRITER constructional article,24 pages including PCB layouts for a keyboard & character generator/memory that hooks onto a standard TV.

COMPUTER constructional article, 4? pages including PCB layouts for a 8 bit computer using the Intel 8008.

Can't supply copies but will loan out the ones sent by Mr. Rowley to UK ACC members if you send 20p (stamps) for each article to cover cost of postage.

mike lord

LETTERS No2

NORTH WEST

I would like to correspond with someone about computers in general, on a fairly simple level on the hardware side, but, hopefully, discussing the more advanced side of programming.

Also, as you have a North London group would anyone be interested in trying to form a North West England group (or just North of England group) so that members could get together and have a chin-wag.

D.Wade 72 Beresford St.
Moss Side, Manchester 14

HELP

I have recently purchased a Solartron CD 523S.2 Oscilloscope but am unable to aquire operating or service manuals for it. I should like to purchase or copy these manuals and would be most obliged to anyone who could help me in this.

P.J.Rodman
53 Sherwood Crescent, Amanzimtoti 4125
Natal, South Africa

BOOKLIST

PROGRAMMING BY TELEPHONE IN BASIC.
£1.40 net

R.C.Rippingale
Sir pitman and Sons Ltd. 1973

This book fully describes BASIC and its use, assuming **no** previous experience of programming. Flowcharting and other computer basics also explained.

Programs in BASIC run on the LEASCO time-sharing system as examples, and reference is also made to the CYBERNET system.

COMPILER BOOKS

Macdonald Computer Monographs ;

6 Assemblers & Loaders (D.Barron)

8 Compiling Techniques (F.Hopgood)

Elsevier ;

Advanced Programming (H.Katzan)

A Laboratory Manual of Compiling and Operating Systems Implementation (Halstead)

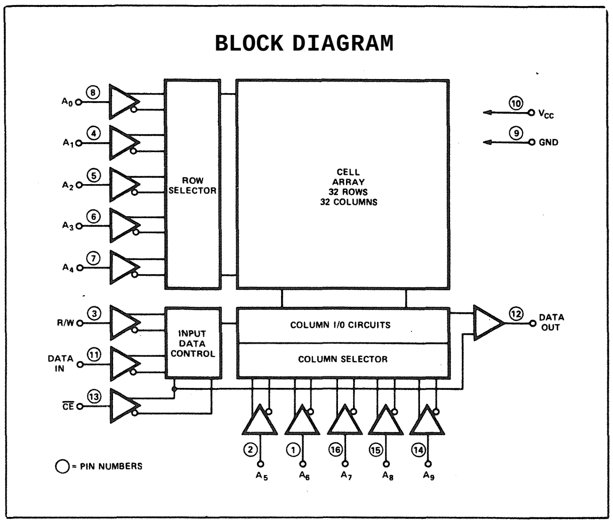
THE ANATOMY OF A COMPILER
J.Lee Van Nostrand Reinhold 1967
(dedicated to the International Federation of Fortran Fiddlers)

ADVANCED PROGRAMMING
H.Katzan Van Nostrand Reinhold 1970

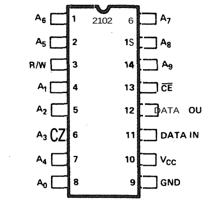
SEMICONDUCTOR MEMORIES
D.Hodge 1972 IEEE Press

intel 2102

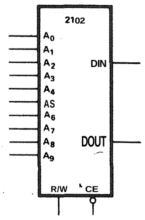
Is a 1024 word by one bit static random access memory which requires no clocks or refreshing to operate. Fabricated with N channel silicon gate technology it is TTL compatible in all respects (fan-out of one standard TTL load, single +5V supply). 150mW. 3-state output .



PIN CONFIGURATION



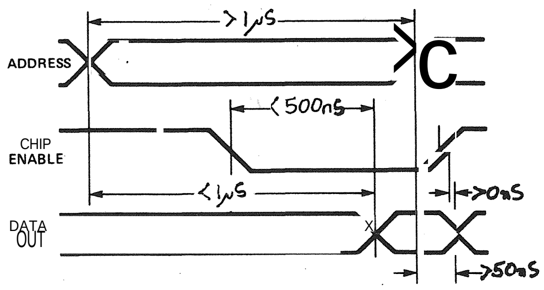
LOGIC SYMBOL



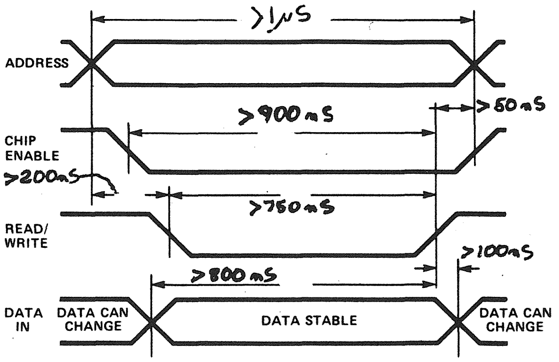
PIN NAMES

D_{IN}	DATA INPUT	$\overline{CE}$	CHIP ENABLE
A_0 - A_9	ADDRESS INPUTS	D_{OUT}	DATA OUTPUT
R/W	READ/WRITE INPUT	V_{CC}	POWER (+5V)

READ CYCLE



WRITE CYCLE



THE PAGING GAME

OR

VIRTUAL STORAGE FOR BEGINNERS

RULES

1. Each player gets several million things.
2. Things are kept in crates that hold 4096 things each. Things in the same crate are called crate-mates.
3. Crates are stored either in the workshop or warehouse. The workshop is almost always too small to hold all the crates.
4. There is only one workshop but there may be several warehouses. Everybody shares them,
5. Each thing has its own thing number.
6. What you do with a thing is to zark it. Everybody takes turns zarking.
7. You can only zark your own things, not anybody else's.
8. Things can only be zarked when they are in the workshop.
9. Only the Thing King knows whether a thing is in the workshop or in the warehouse.
10. The longer a thing goes without being zarked, the grubbier it is said to be.
11. The way you get things is to ask the Thing King. He only gives out things in multiples of 8. This is to keep the royal overhead down®
12. The way you zark a thing is to give its thing number. If you give the number of a thing that happens to be in a workshop it gets zarked right away. If it is in a warehouse, the Thing King packs the crate containing your thing back into the workshop. If there is no room in the workshop, he first finds the grubbiest crate in the workshop, whether it be yours or somebody else's, and packs it off with all its crate-mates to a warehouse. In its place he puts the crate containing your thing. Your thing then gets zarked and you never know that it wasn't in the workshop all along.
13. Each player's stock of things have the same number as everybody else's. The Thing King always knows who owns v/hat and whose turn it is, so you can't accidentally zark somebody else's thing even if it has the same thing number as one of yours.

NOTES

1. Traditionally, the Thing King sits at a large, segmented table and is attended to by pages (the so-called "table pages") whose job it is to help the king remember where all the things are and who they belong to.

2. One consequence of Rule 13 is that everybody's thing number will be similar from game to game, regardless of the number of players,

3. The Thing King has a few things of his own, some of which move back and forth between workshop and warehouse just like anybody else's, but some of which are just too heavy to move out of the workshop.

4. With the given set of rules, oft-zarked things tend to get kept mostly in the workshop while little-zarked things stay mostly in a warehouse. This is efficient stock control.

5. Sometimes even the warehouses get full. The Thing King then has to start piling tilings on the dump out back. This makes the game slower because it takes a long time to get things off the dump when they are needed in the workshop. A forthcoming change in the rules will allow the Thing King to select the grubbiest things in the warehouses and send them to the dump in his spare time, thus keeping the warehouses from getting too full. This means that the most infrequently-zarked things will end up in the dump so the Thing King won't have to get things from the dump so often. This should speed up the game when there are a lot of players and the warehouses are getting full.

LONG LIVE THE THING KING

anon.

SALE!

The following equipment is currently being offered on tender;-

D.O.E. Hastings
2 x ICL 1302
16K core/48 bit 12K drum
8 x 1" magtape teletype
buffered 1000 lpm printer
buffered 1000 cpm reader

Metropolitan Police. London
2 x ICL 1301
2K core/48 bit 24K drum
600 cpm reader 600 lpm prntr
5 x $\frac{1}{2}$" 10 track mag tape

(information from Galdor © mid March)

MEMBERSHIP of the ACC for the year 1 April 1975 to 31 March 1976 plus subscription to Vol 3 of the Newsletter costs £1 (50p for UK members aged 16 or under on 1 April 75)

Vol 3 of the Newsletter will consist of 6 issues, to be published at 2 month intervals from April 1975.

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Vol 3 Iss 1 April 1975

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