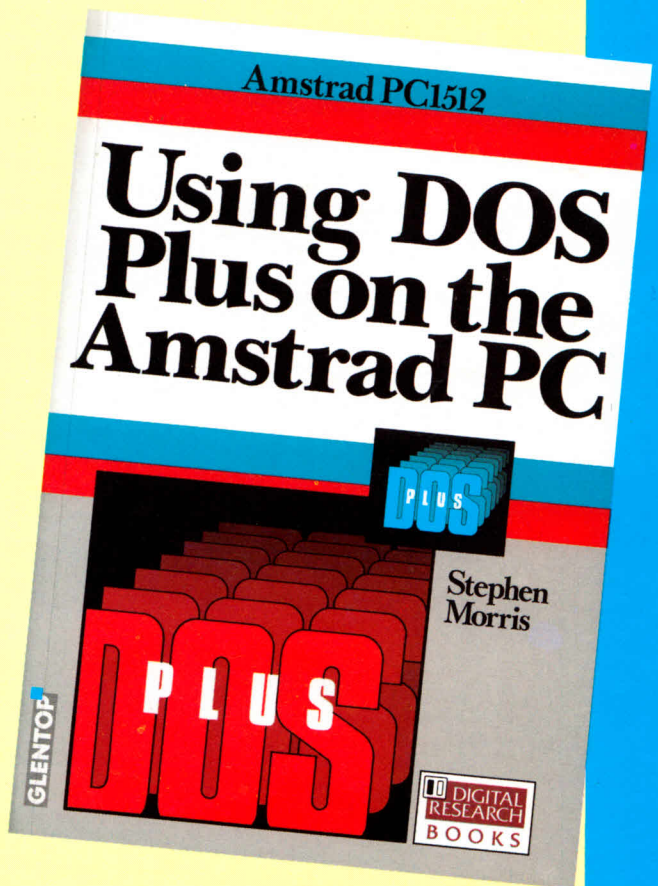
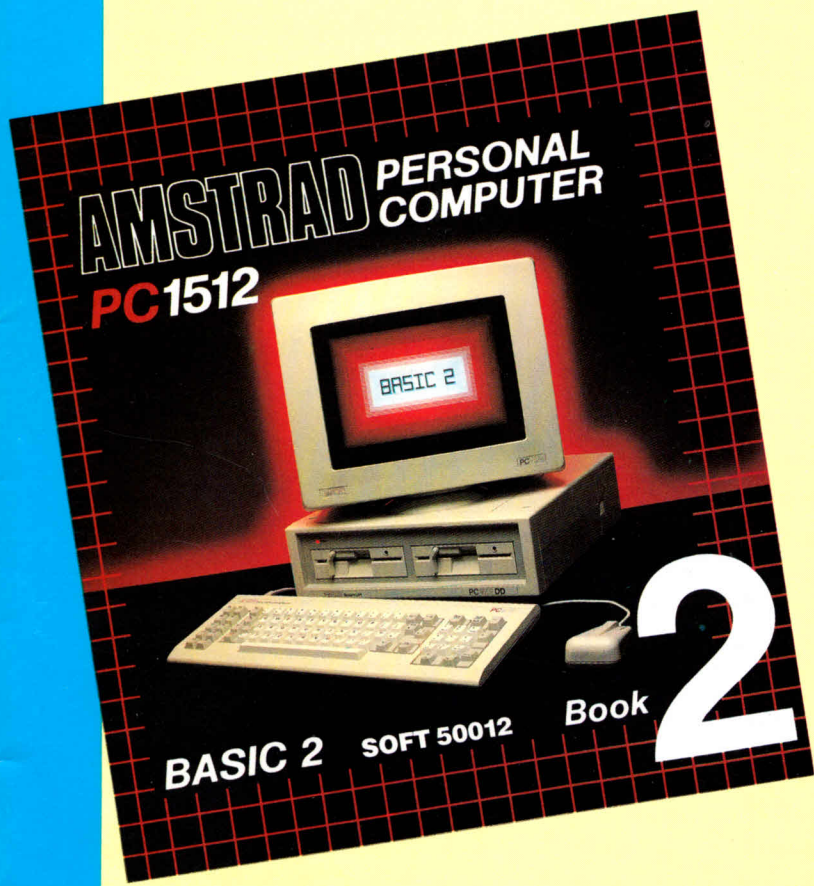


The Aussie Mag  for Amstrad owners

THE AMSTRAD USER

Issue No. 30 \$3.75

July 1987



- *Drum Kit Synthesiser and Cribbage type-ins for all CPCs + Hot Tips for advanced programmers + Sentinel*
- *SuperCalc type-in plus four others for PCWs + review of LocoMail + Secrets of MAIL232*
- *Dynamic Duo for PCs: Compact Accounts and Ability*

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THE AMSTRAD USER

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July 1987

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All enquiries and contacts concerning this Publication should be made in the first instance by writing to The Amstrad User, Suite 1, 245 Springvale Road, Glen Waverley, Victoria 3150, Australia. Urgent matters can be phoned through on (03) 233 9661.

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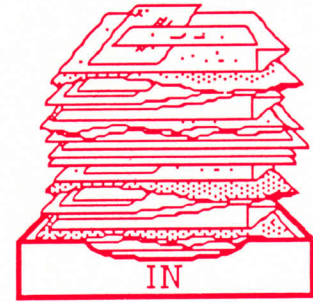
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other interested parties. In most circumstances the following payments will apply to published material: Letters \$5.00, Cartoon \$5.00 and a rate of \$10.00 per page for programs, articles etc.

Contributions will not be returned unless specifically requested coupled with a suitable stamped and return addressed padded bag (for tapes or discs).

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Letters



You may notice a slightly different layout to your magazine this month. With a little "nipping and tucking" we've managed to gain about 10% more space, and at the same time make each section more legible and easily identifiable.

Most of the changes are a result of suggestions from readers which goes to prove that although we don't reply to all the letters we get, we do read them all!

As from next month, we are scrapping the payment of \$5 to the writers of published letters, and replacing it with one payment of \$25. This will be paid for the letter which the Editor considers to be the most interesting/controversial/useful or whatever other adjective comes to him at the time.

I am writing this to mobilise Amstrad owners who have bought the AMX Pagemaker package from Advanced Memory Systems.

The bottom line is that we have been sold a lemon, and it now appears there is little hope of some solution to the problem.

Pagemaker does not work.

Regardless of the alleged glowing Press reports and reviews in magazines, Pagemaker cannot live up to its promise of a desk top publishing package.

The fault for this does not lie with the retailers in Australia (although they too must be getting sick and tired of handling complaints) but with AMS in the UK.

The first version of the program was bug-ridden and some features were

not installed. The second version is not much better.

The principal failing of the package is that it offers no way to format text in columns. This, combined with errors in the gridlock system, error messages which corrupt the screen and disc-handling errors, add up to a commercial software package that does not live up to its producer's claims. In basic language 'someone's been ripped off!'

I'm not slamming the program entirely, it promises to be the best package available on the humble Amstrad, if it worked.

But it does not.

I have written three letters, and telephoned AMS and was sent a new copy (version 2) of the program, but none of my complaints have been attended to. It appears as if the company does not care.

I am asking all owners of the software, and perhaps those intending to buy, to write to AMS and express their opinion.

The person to write to is
Gerard Richardson
Advanced Memory Systems
166-170 Wilderspool Causeway
Warrington WA4 6QA,
England.

Unless the company feels the wrath of disappointed purchasers, how can it help?

This may have sounded very hard on AMS, but perhaps the time has come.

Nick van Kempen, Wardell, NSW

Here are a few problems that I encountered while playing the following games:

1. Lighthouse - in lines 1090 and 1160 there is a syntax error caused by the omission of the first quotation

mark of the Print statement.

- in line 2390 the two

ANDs together cause a syntax error. Delete one of them.

2. Lord of the Rings - Does anyone know how to get past the Barrow-wright?

3. Bastow Manor - Does anyone know how to get inside the Manor itself (I have the ladder and iron key).

Lindsay Wells, Seven Hills, NSW

Thanks for the info on the Lighthouse, Lindsay. Don't forget the correction to line 200 we printed last month. Any more for any more?

In the May issue of TAU, in the article entitled "Tape Troubles", I noticed a brief mention of 'write error a' which was caused by the write frequency being too high. To alter the tape write frequency, you just have to "POKE &B8D2," and the number of the frequency you want. The lower the number, the higher the frequency. Any number lower than 27 will register a 'write error a' while saving. Using this poke, some very fast frequencies can be obtained as well as some very slow ones (for instance, try putting 100 after the comma). I got this idea from the March issue of ACU.

On the subject of tape troubles, I have recently purchased "Azimuth" from Interceptor Micros and would thoroughly recommend it. It has cured all my loading problems.

Matthew Quicke, Albany, WA

Apropos your note on "Better Maths 1" (page 21 of Issue 28) there was obviously a spelling error in MEASURATION... MENSURATION

being the intended word. Mensuration is derived from the latin first declension verb MENSURARE meaning to measure. Hence, mensuration is that part of mathematics which deals with lengths, areas, volumes etc.

I quote the above since during my working life I taught mensuration; first to children and later to the armed servicemen.

K. Cook, Stafford Heights, QLD

Thanks. (Old English THANCIAN; related to Old Frisian THANKIA, Old Norse THAKKA, Old Saxon and Old High German THANCON).

Your readers may be interested in a tip I have found useful in entering data codes separated by commas when using the numeric keypad on the CPC 6128. Rather than keep jumping to the main keys, the decimal point may be defined as a comma with KEY DEF 7,0,44 while the original decimal point can still be accessed if used with the

shift key.

```
1 a$="part":KEY DEF 7,0,44:KEY
156,"SAVE a$"+CHR$(13):KEY DEF
17,1,156:KEY,"list"+CHR$(13):KEY
DEF 19,1,157:STOP
```

If the above line is entered and RUN at the start of a listing (and removed upon completion), it will generate the re-definition as well as providing a quick SAVE by pressing the left hand square bracket (near the Return Key), and a LIST of the program by use of the right hand square bracket just beneath.

After entering a complete program and deleting line 1, your program can be saved to the desired name and the last "PART.BAS" and PART.BAK" copies erased from the disc.

Kenneth S. Boye, Canada Bay, NSW

I bought my PC1512-DD as a New Year present because I was unhappy with the mathematical capabilities of the spread sheets available to me on

my previous CPC464.

The Basic 2 manual took a long time to come, and now it is here I am mathematically disappointed. I have found Basic 2 is not suitable for general purpose programs.

1. It is inconsistent. It automatically rounds up only sometimes, while at other times it automatically rounds up or down. It does this without giving me the choice of choosing which, or of choosing to stay with decimals.
2. It can be incorrect. After requesting an answer in decimals by PRINT USING "####.###" it will then round up and print 3 zeros after the decimal point if there is a negative integer multiplied by zero in the equation.
3. It contains an error. Again, this relates to a negative integer multiplied by a zero.
 - a) Basic 2 calculates the following equation quite correctly when it is by itself:

$$-n * 0 = 0$$
 - b) Basic 2 also gives a correct and

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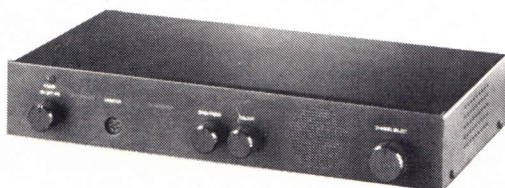
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adequate (9 digit numeric or 10 digit integer) answer to 2 variables multiplied together, whether they be positive or negative:

$$a * b, -a * -b, -a * b$$

or $a * -b$

c) But when these two equations are added or subtracted, with or without brackets, Basic 2 gives some inconsistent results and an error:

$$-n * 0 + a * b =$$

or

$$(-n * 0) - (a * b)$$

d) With a positive integer "n" the answer is correct:

$$4 * 0 + 3 * 0.4 = 1.2$$

$$4 * 0 + -3 * 0.4 = -1.2$$

$$789 * 0 - 357 * 12.6 =$$

$$-4498.2$$

e) With a negative decimal "n" the answer is correct:

$$-0.4 * 0 + -3 * 0.16 =$$

$$-0.48$$

$$-0.4 * 0 = -3 * 0.17 =$$

$$-0.51$$

f) With a negative integer "n" we get some very strange answers:

$$-4 * 0 + -3 * 0.1 = 0$$

Rounded down 0.3

$$-4 * 0 + -3 * 0.16 = 0$$

Rounded down 0.48

$$-4 * 0 + -3 * 0.17 =$$

$$-1E+01$$

?

$$-4 * 0 + 3 * 0.4 = 2$$

Rounded up 0.8

$$-4 * 0 + -3 * 0.4 = -1E+01$$

??

$$-4 * 0 + -3 * 2 = -1E+01$$

???

$$-4 * 0 + -3 * -2 = 6$$

Correct

$$-4 * 0 + -300 * 800 =$$

$$-1E+01$$

!!!!!!

$$(-789 * 0) + (357 * 12.6) =$$

$$4499$$

Rounded up 0.8

$$(-789 * 0) - (357 * 12.6) = -$$

$$1E+01$$

And yet again!

g) When the problem "-n * 0" is added to a decimal, the answer is rounded up or down:

$$-4 * 0 + 0.4 = 0$$

Rounded down 0.4

$$-4 * 0 + 0.5 = 1$$

Rounded up 0.5

$$-4 * 0 + 0.6 = 1$$

Rounded up 0.4

```
PRINT USING "####.###";
-4 * 0 + 0.6 = 1.000
```

Wrong

```
PRINT USING "####.###";
-8 * 0 + 789 = 789
```

Correct

I wonder if any of your readers have come across the same problems and solved them. Quite obviously Basic 2 cannot be used reliably for general mathematical programming with the error and these inconsistencies. Can Amstrad and Locomotive Software do anything about it?

Doug Fortescue, Shelley, WA

We have taken the problem up with Locomotive Software and will report back with the results. In the meantime, if anyone can shed some light on this apparent floating point problem we would like to hear from you.

Here are some more pokes for the CPC 6128.

44433 Derr value

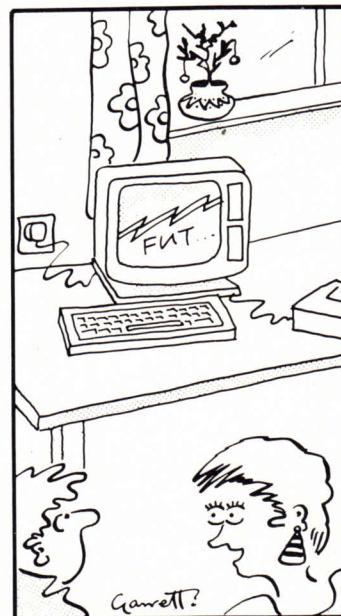
44636 Zone value

45331 Deg/Rad (0:Rad, 1-255:Deg)

46771 1st mask value

46770 2nd mask value

47058 2nd speed ink value



"ACCORDING TO THE COMPUTER WE HAVEN'T PAID OUR ELECTRICITY BILL"

47059 1st speed ink value
46743 Xpos mod 256
46744 Int (Xpos/256)
46745 Ypos mod 256

The following will reset the clock or TIME command to zero.

```
10 FOR A=47284 to 47287
```

```
20 POKE A,0
```

```
30 NEXT
```

In my letter (Page 6, TAU March 1987), POKEing numbers in the Symbol After location will produce wierd results - sorry!

Chris Wooton, Mornington, Tas

These spelling cheque programs are awl very well but what sum people don't seam to realise that if a word is mis-spelt for the meaning intended, butt is still a word with another meaning, the spell check device will knot detect an error.

Eye mean, you can't expect the computer to no, or even to now, what you are trying to say. Awl it can due is to sea weather the word you have typed is inn the dictionary and if it is, it clears it for publication without sew much as a bleep.

Sow, if you don't happen to now the difference between its and it's (and maw than half the population must be inn this category), ewe can bee assured your spell-check program knows know better.

Its knot that I am against these programs, I'm shore they have some value in preventing typists from righting seperate instead of separate and from committing other similar, frequently scene howlers. Their all so useful in signalling those many occasions when you transpose letters to make funny wrods like tihs. Or when you hit too quays at the same thyme and malke woressd loike tyhisd, witch are certainly knot in the dictionary and sow wood be court by the program.

On the other hand, if a mis-typing or transposition happens to make a legitimate word, albeit not the won you had in mind, the program will let it threw. It is not unusual, for example, to see now printed where not was intended, with disastrous affects on the

meaning (and your program will not distinguish between affect and effect, nor for that matter between principle and principal).

If you happen to be writing a scientific treatise, the dictionary will not contain many of the words you may wish to use, and you will have to add them to the dictionary as you go along. This pre-supposes that you no how to spell them correctly in the first place and this is quite a pre-supposition in itself.

Another supposition you have to make is that the compiler of the spell cheque program knows how to spell. Does he allow onto into his vocabulary? Or think alright is all right?

So don't invest in a spell check program expecting it to guarantee an immaculate manuscript every time. In this short article there are forty-for misspelt words (quite apart from any printer's errors which might have crept in) all of which would have been waved (or even waived) through.

Michael Banister

I bought a "Joyce" about a year ago, as an alternative to a portable typewriter, and apart from a few crashes whilst printing I've had very few problems, bar 2 major ones.

Both of these concern the printer. Firstly, when using any paper heavier than about 90 grammes it was necessary for me to keep my finger on the bail bar to stop the paper from slipping, this being a very annoying task when printing a long official document and also halving my typing speed from 2 to 1 fingers!

The second problem is that I have been totally unable to get a screen dump no matter what combination of keys I pressed, including ALT + P. I assume that this is a hardware problem and I have not been able to check it as my "Joyce" is still in Ethiopia awaiting my return later this month.

David Brown

Your first problem is really a function of the printer. It's not really designed for heavyweight paper (most paper

sold for listings is around 70gsm). The second problem is easily solved. The keys you press for a screen dump are EXTRA + PTR.

All letter for the Mailbag section should be addressed to:

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We regret that we cannot enter into any personal correspondence.

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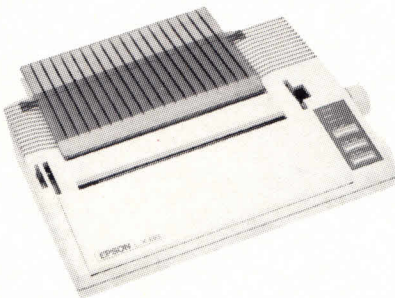
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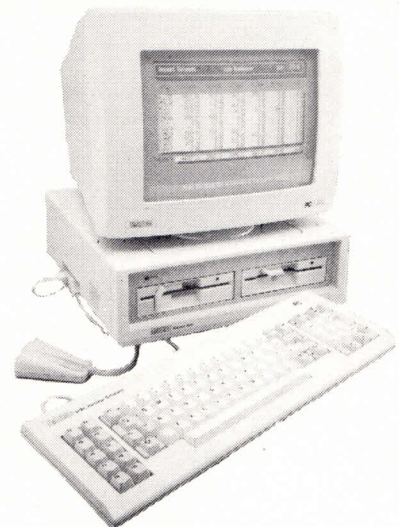


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 Treasurer: Lindsay Bell (03 758 9921)
 Secretary: Wayne Darvell (03 221 2182)
 Venue: Country Womens Association Hall, 4 Sundew Avenue, Boronia from 7.00 pm. every second Monday of the month.

NORTHERN AMSTRAD USER GROUP

Contact: Brian Ellis (03 469 4425)
 Venue: Preston every second Sunday. Contact above for more details.

SOUTHERN AMSTRAD USER GROUP INC.

President: Peter Bradley (03 786 3953)
 Secretary: Bob Patterson
 Treasurer: Vickie Finlayson (059 98 8328)
 Venue: Senior Campus at John Paul College, Frankston every third Tuesday from 7.30 to 10.30 pm.
 Mail: The Secretary, PO Box 100, Seaford, Vic 3198.

WENDOUREE AMSTRAD USER GROUP

Contact: Brad Maisey (053 44 8356)
 Venue: Cnr. Charles and Appleby Drive, Cardigan Village on the first Sunday of each month at 3.00 pm.

WESTERN COMPUTER CLUB

Venue: Fairbairn Kindergarten, Fairbairn Road, Sunshine on alternate Tuesdays from 6.30 pm.
 Mail: PO Box 161, Laverton 3028.

ACT

CANBERRA AMSTRAD USER'S GROUP

Convenor: Neale Yardley
 Secretary: Steven Walker (062 58 2323)
 Treasurer: Roger McLennan (062 82 3064)
 Venue: The Oliphant Building, ANU, Canberra on the first Wednesday of each month from 7.30 pm.
 Mail: PO Box 1789, Canberra, ACT 2601.

NEW SOUTH WALES

AM-USER's (North Ryde)

Contact: Lawrence Walters (02 888 1898)
 Venue: Meeting Room at 2 Leisure Close, North Ryde from 7.30 p.m. on the first Tuesday of each month.

BLUE MOUNTAINS AMSTRAD USERS

President: Bob Chapman (047 39 1093)
 Vice Pres: Dennis Shanahan (047 39 4568)
 Treasurer: Peter Traish (047 53 6203)
 Secretary: Christine Preston (047 51 4391)
 Venue: Springwood Neighbourhood Centre,

USER GROUP INFORMATION

Macquarie Road, Springwood on the fourth
Wednesday of each month at 8.00 p.m.

CENTRAL COAST AMSTRAD USERS CLUB

President: Lloyd Mitchell (043 88 2950)
Secretary: Ray Thompson (043 32 9095)
Venue: The Entrance Aquatic Club, Salt Water Reserve, Long Jetty every second Monday at 7.30 p.m. sharp.

COFFS HARBOUR AMSTRAD COMPUTER CLUB

President: Bruce Jones (066 52 8334)
Secretary: Don Donovan (066 52 6909)
Treasurer: Brian Claydon (066 49 4510)
Venue: Orara High School, Joyce Street from 7.00 pm. on the first Friday of each month.

FAIRFIELD MICRO USER GROUP

Contact: Arthur Pittard (02 72 2881)
Venue: Room 65, Canley Vale High School, Prospect Road, Canley Vale every third Wednesday from 7.00 pm.

ILLAWARRA AMSTRAD USERS CLUB

President: Paul Simpson (042 27 1574)
Secretary: Ken Waegele (042 56 6105)
Publicity Off: Steve Parsons (042 96 3658)
Venue: AGA Germania Club, Berkeley at 2.00 pm. every third Saturday.

LISMORE DISTRICT AMSTRAD COMPUTER CLUB

President: Max Muller (066 337 113)
Vice Pres: Nick Van Kempen (066 874 579)
Sec/Treas: Chris Rosolen (066 216 810)
Venue: CYSS Hall, 16 King Street, Lismore on the last Tuesday of each month from 6.30 pm.
Mail: PO Box 88, South Lismore, NSW 2480

S & W MILLER AMSTRAD USER'S CLUB

President: Wal Sellers (049 33 5459)
Secretary: Nikki Lee (049 33 5459)
Treasurer: Georgina Todd (049 66 2788)
Venue: Maitland Park Bowling Club, Maitland on the second Tuesday of each month at 7.30 pm.

NAMOI AMSTRAD USERS GROUP

Contact: Martin P. Clift, JP (067 92 1333) B/H
(067 92 3077) A/H
Venue: Narrabri Technical College, Barwan Street, Narrabri on the first Saturday of each month at 2.00 p.m.

NEWCASTLE AMSTRAD USER GROUP

President: John Harwood (049 48 5337)
Treasurer: Erica Harwood
Secretary: Chris Hollander (049 67 5864)
Venue: Kotara Public School, Park Avenue, Kotara on the first Tuesday of each month. Contact the above for meeting times.

PCW AUSTRALIA GROUP

Contact: Reuben E. Carlsen
Venue: Permanent venue to be arranged shortly. Meetings planned for the second Tuesday of each month from 7.30 pm.
Mail: PO Box 1879, North Sydney, NSW 2060.

PORT MACQUARIE AMSTRAD USERS GROUP

Mail: Craig Tollis, Box 584, Port Macquarie, 2444.

SYDNEY AMSTRAD COMPUTER CLUB

President: Bob Knowles (02 810 7373)
Secretary: Reed Walters (02 560 9487)
Treasurer: Jim Chryst (02 327 7872)
Venue: Newtown area on the 1st Saturday of every month for a normal club meeting and on the 3rd Saturday for the purposes of programming tutorials only. Both meetings commence at 2.00 p.m. For more details contact either the Secretary or Treasurer between 6.00 p.m. and 9 p.m.

SYDNEY PC1512 USER GROUP (next column)

Contact: Geoff Craine (02 76 6467) A/H
(02 412 9213) B/H
Venue: To be arranged; meeting initially on the third Tuesday of each month at 7.00 pm.

QUEENSLAND

BRISBANE AMSTRAD COMPUTER CLUB

President: Paul Witsen (07 393 4555)
Secretary: John Roberts (07 283 3349)
Treasurer: John O'Connor (07 271 3350)
Librarian: Peter Golledge (07 376 1651)
Venue: Main meetings at in Room 15a of Junction Park State School, Waldheim St., Annerley starting at 7.30p.m. Another is held at Wynnum Central State School, Florence Street, Wynnum Central on the first Saturday of each month at 1.00p.m. The co-ordinator is Warren Kennedy (07 351 4232). A third is held at Newmarket State School, Banks St., Newmarket on the second Saturday of each month at 1.30p.m. The co-ordinator is Cherry Shrier (07 351 6179).

BUNDABERG AMSTRAD USER'S GROUP

President: Ray Babbidge (071 72 1223)
Secretary: Ron Simkin
Treasurer: Sheila Cole (071 72 8884)
Venue: The third Tuesday of the month. For more details contact the above.
Mail: PO Box 865, Bundaberg, QLD 4670.

CABOULTURE AMSTRAD USER GROUP

President: John D'Archambaud (071 95 4860)
Secretary: Stephen Yench
Treasurer: Craig Deshon
Venue: Contact above number for more details.

CAPRICORN AMSTRAD USERS GROUP

Contact: Graeme Annabell (079 27 4915)
Venue: Waraburra State School, Gracemere on the first Friday of each month at 7.00 pm.

GOLD COAST AMSTRAD USER GROUP

Contact: Mark Abbott (075 31 2114)
Venue: Ashmore Health and Medical Centre, Cotlew St. on the first Saturday of each month at 2.00.
Mail: 17 Ewan Street, Southport, Qld 4215

HERVEY BAY - MARYBOROUGH AMSTRAD COMPUTER USER GROUP

President: Ian Jardine (071 28 3688)
Vice-Pres: Gerhard Schulze
Sec/Treas: Les Patford (071 28 9737)
Venue: Sports Club, Tavistock Street, Torquay on the first Thursday of each month at 7.00 pm.

MACKAY AMSTRAD USER GROUP

Contact: Des Mulrealley (551 409)
Ron Coates (547 222)
Venue: Meet every second Sunday morning. Contact the above for location and time.

PENINSULA AMSTRAD CLUB

President: Ivan Dowling (07 269 8795)
Treasurer: Keith Johnston (07 203 2339)
Secretary: Tracie Payne (07 267 6645)
Venue: Kippa-Ring State School Library, Elizabeth Avenue every third Tuesday of the month at 7.30 pm.

SOUTHSIDE AMSTRAD USER GROUP (QLD)

President: Michael Toussaint (07 200 5414)
Vice-Pres: Peter Incoll (07 208 2332)
Secretary: Ken Henry (07 208 8730)
Treasurer: Wayne Stephens (07 287 2459)
Librarian: Brian Moore (07 209 1488)
Venue: Loganlea State High School (in the Communications Room) every third Saturday of the month starting at 2.00 p.m. A Basic programming course is held fortnightly.

TOOWOOMBA AMSTRAD USERS GROUP

President: Stephen Gale (076 35 5001)
Vice-Pres: Robert Nisbet (076 35 7025)
Secretary: Malcolm Woodside (076 32 8867)
Treasurer: Peter Fraser (076 34 7032)
Venue: Toowoomba Education Centre, Baker Street, Toowoomba on the 4th Monday of each month.

TOWNSVILLE AMSTRAD USER GROUP

President: Ian Wallace (077 73 1798)
Vice Pres: Doug Selmes (077 79 6011 xt 252)

Treasurer: Allan Maddison (077 79 2607)
Secretary: S. Crawshaw (077 73 3933)
Venue: Science Block of the Kirwan High School in Thuringowa Drive on the first and third Tuesdays each month at 7.30pm.

THE WARWICK AMSTRAD USER GROUP

President: Mrs. D. Christensen
Secretary: John Wade (076 61 5176)
Treasurer: Neville Christensen
Venue: Warwick Education Centre on the first Saturday of each month from 3.00 p.m.

WEIPA AMSTRAD USERS CLUB

President: Andrew Seaborn
Vice-Pres: Dave Wootton
Treasurer: Frances Casey
Secretary: Gary Chippendale (070 69 7448)
Venue: Noola Court in Weipa. Contact above for more details.
Mail: 15 Noola Court, Weipa, QLD 4874.

WESTERN SUBURBS AMSTRAD USERS GROUP

President: Peter Wighton (07 288 4571)
Secretary: Jimmy James (07 376 1137)
Contact: Keith Jarrot (07 376 3385)
Venue: The Jamboree Heights State Primary School, 135 Beanland Street, Jamboree Heights at 1.30 p.m. on the first Saturday in each month.
Mail: Jimmy James, 36 Penong Street, Westlake, Brisbane 4074.

TASMANIA

SOUTHERN TASMANIAN AMSTRAD USER CLUB

President: Frank Self (002 49 5499)
Secretary: Peter Campbell
Treasurer: Cindy Campbell
Publicity Off: Danny Britain (002 47 7070)
Venue: Elizabeth Matriculation College on the first Wednesday of each month from 7.30 pm.

NORTHERN TASMANIA AMSTRAD COMPUTER CLUB

President: Paul Gerard (003 34 0441)
Treasurer: Russell Lockett (003 44 8972)
Secretary: Andrew Blazely (003 93 1687)
Publicity: Marie Griffiths (003 93 6568)
Venue: Launceston Community College (opposite Park Street) in Room 11 on the first Saturday of the month at 5.00 p.m.

N.W. COAST AMSTRAD USER'S CLUB

President: John Wilson (004 31 7162)
Treasurer: Peter Cocker
Publicity: Noel Davies (004 31 8490)
Venue: Burnie Technical College, Mooreville Road, Burnie on the third Saturday of each month at 1.00 p.m.

NEW ZEALAND

AMSTRAD CANTERBURY

Contact: Christine Linfoot 459 132
Ian Orchard 524 064
Venue: Four Avenues School, cnr. Madras Street and Edgeware Road, Christchurch 1 on the fourth Wednesday of each month.
Mail: PO Box 23.079 Templeton, Christchurch, NZ.

WELLINGTON AMSTRAD USER GROUP

Contact: Tony Tabbs 791 072 (evgs)
Venue: Room 718, Kirk Block, Victoria Univ. on the last Wednesday of each month from 7.30 pm.
Mail: PO Box 2575, Wellington, New Zealand.

**Closing date on
amendments to this list for
Issue 33 (September 1987)
is 24th July 1987**

Memories are made of this . .

"Please can you explain the memory? I am completely lost by it. Programmers use Calls and Pokes and Peeks and numbers and things! What are they? How do they work? I am learning rapidly, but have come to a sticky end with memory." If we had a dollar for every letter similar to the above we could almost sponsor the next America's Cup challenge!

Ian Barnes presented you with an introduction to PEEKing and POKEing last month. We take things a stage further and explore memory maps.

Figure 1 gives you an idea how your Amstrad's memory is configured. Random-access memory (ram) can be written to or read: everything that you type in at the keyboard is recorded into memory somewhere - a mishmash of keypresses such as A4ghjR&%R& will be stored temporarily, intelligent entries (for example, 10 PRINT 3.24*8) will be stored until you either switch off the machine or issue the NEW command.

Basic programs start at memory location 368 (&170). Try entering the line:

```
10 PRINT "I have been stored in memory"
```

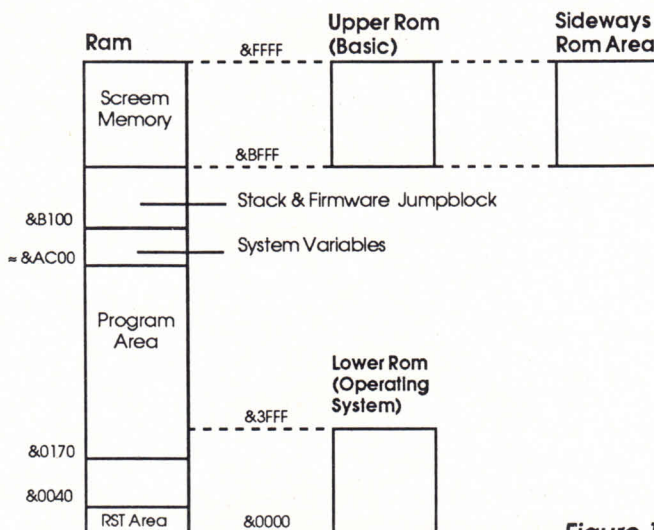


Figure 1

As the line says, it has been stored. Not, however, as you typed it in. But rather as a string of numbers. You don't believe me? Enter in direct mode (that is, without using a line number) the following:

```
FOR t=368 to 393:PRINT PEEK(t);"";:NEXT t
```

You will get a row of numbers on screen like this:

```
26 0 10 0 191 34 73 32 104 97 118 101 32 98
101 101 110 32 115 116 111 114 101 100 34 0
```

That is your one line Basic program; and that is how it is stored inside your computer. The first number tells you the length of the program line - in this case 26 characters (go on, count them). The next number (or byte) also refers to the length of the program line. At first it won't be obvious how two decimal numbers (in different memory locations) can be thought of as a single number - this will be explained later. For now just believe me when I say that the length of your Basic program is calculated by: $(0*256)+26$ which equals 26. If, for example, the number preceding 26 (in the row of numbers) was 47 then the length of your Basic program would be $(47*256)+26$ which equals 12058.

The third and fourth numbers in the row refer to the line number of the program line. Again two bytes are used to represent a single number: the value 10 is the low byte and value 0 the high byte. Enter in direct mode POKE 370, 20. Now list the program; you should find that the line number is 20 rather than 10. If you then POKE 371, 1 and list the program again the line number will now show 276 - not obvious? It is calculated by $(1*256)+20$.

You have discovered the length of the line and altered its line-number. The next item that is stored is the command - in our example it was PRINT. The value 191 represents the command PRINT. Try altering that by POKE 372, 190. List the program; the command PRINT will have changed to POKE. Entering different numbers will cause other command words to appear.

The remaining numbers (bar the last) tell the program what is to be printed. Each number refers to an Ascii character. For example the number 65 represents the Ascii character A. At the back of your Amstrad User manual there is a list of numbers and the characters they represent.

A value zero (the last number in the row) tells the computer that the line has ended. In other words, it is a terminating byte.

You have seen how the computer stores Basic programs in

memory as a series of numbers. You have also used PEEK and POKE. You may not have realised what PEEK and POKE were doing, so read on. The command PEEK allows you to look at the contents on any memory location. POKE does the opposite; it allows you to alter the contents of any memory location. Enter the command `PRINT PEEK(1000)`. This will ask the computer to print the value held in memory location 1000. The value returned will be 0. Now enter `POKE 1000,25` followed by the command `PRINT PEEK(1000)`. A value of 25 will be returned (the number we used with the POKE command). As you see, PEEK and POKE aren't quite as daunting as they first seemed.

The CALL command is used to run a machine-code routine from Basic. Type in and run the short Basic program below, it pokes the machine-code into memory. After running the program enter the command `CALL 30000`. Okay, nothing spectacular happened, but the program served its purpose - it demonstrated the use of CALL.

```
10 FOR t=30000 TO 30005
20 READ a:POKE t,a:NEXT t
30 DATA 62,7,205,90,187,201
```

Firmware routines under CPM Plus

Here's another question - "I have a 464 with DDI and 64k expansion ram. When running CPM 2.2 I can utilise most firmware routines by using the ENTER_FIRMWARE call at &BE9B. Having borrowed CPM Plus (or 3.1) from a friend I tried using it on my expanded 464. It works, however, the call &BE9B does not work. Why is this? Is it a problem with the CPM Plus environment or should I be calling a different routine? I pray it isn't connected with CPM's USERF - having read a chapter concerning USERF about 50 times I still can't get to grips with it."

CPM Plus will considerably alter your Amstrad's memory map. In fact, virtually all action takes place in the second bank of memory (look at figure 2).

When using CPM 2.2 it is quite a simple matter to access the Amstrad's firmware - either by using the call at &BE9B

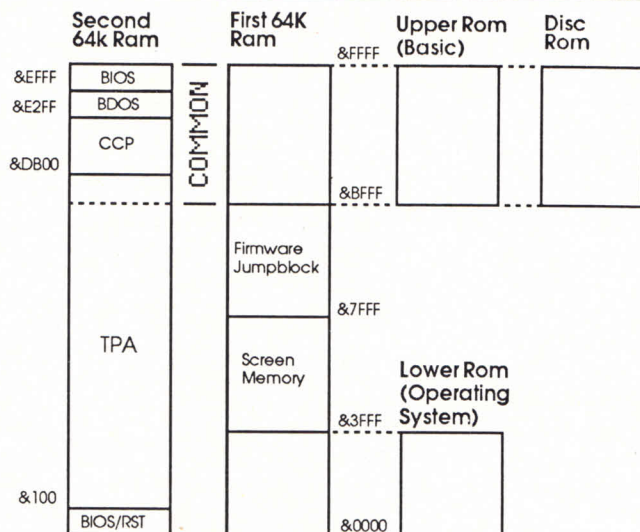


Figure 2

or by preserving the BC' register and carry' then jumping directly to the firmware routine. The latter is not recommended but it works - note also that your program will not be portable to other CPM-using machines.

As Figure 2 shows, none of the Amstrad firmware routines are present in the memory bank containing CPM Plus. To access them, banks must be switched, registers saved and a lot of headaches endured. If you know what's going on then it is possible to do this manually - I suggest you stay sane and manipulate USERF. Userf is by no means friendly; what it allows you to do though, is jump to the required Amstrad firmware routine without having to worry about bank and register states.

After reading through the paragraph on Userf in the book The Amstrad CPM Plus by Andrew Clarke, I was thoroughly confused. A phone call to the author proved that he too was confused - that particular section of the book was provided by Locomotive Software. A helpful person at Locomotive provided the following solution:

Fetch the word at location &1 (this contains the jump address for a warm boot), add 87 decimal to it. You have now got the address for the Userf jump entry. Place this value in a handy place in memory, putting &CD in front of it. After the Userf entry you should place the firmware routine you wish to access followed by a return (&C9). All that remains is for you to set up the registers as they would be used by the firmware routine and call the Userf entry.

Finding the Userf jump entry in such a manner may seem rather odd; the fact is that if Locomotive decides to alter the BIOS at any time, using this method will ensure compatibility with future versions. If you still feel rather lost this assembly listing should clarify matters:

```
ORG &100
LD HL, (1)
LD DE, 87
ADD HL, DE
LD (user), HL

LD HL, &BB5A
LD (routine), HL
LD A, 7
CALL userf
RET

userf
DEFB &CD
user
DEFW 0
routine
DEFW 0
RET
```

This example does nothing spectacular - it causes the computer to beep at you using the TXT_OUTPUT routine (&BB5A) - but it serves to demonstrate Userf. Note that you won't be able to use this program on a CPM 2.2 system or any CPM system other than a CPC machine. You will also find that many firmware routines (for example KL_ROM_WALK;&BCCB) will not work causing the machine to lock up.

Cheat Mode

To make up for the fact that Cheat Mode got the flick last month, we present for your delectation a mammoth bundle of finger-blistering cheats.

IMPOSSABALL

The unstoppable Tony Hoyle has hacked into Hewson's bouncing game. You are treated to infinite time and lives. If that doesn't take your fancy, you can choose an automatic-completion-of-a-level when-you-die poke.

Enter the poke using Method 1. One point to be wary of: if you select infinite time you cannot have the complete-level-when-you-die poke - with both pokes selected, the program crashes.

```
1 ' Impossaball
2 ' by Tony Hoyle
3 ' The Amstrad User July 87
50 MEMORY &13FF:MODE 1
60 LOAD"!",&8000
70 CALL &8000
90 LOAD"!",&1400
100 INPUT"Infinite Time";a$
110 IF a$="n" THEN 140
120 POKE &9634,0
125 POKE &963D,0
130 GOTO 170
140 INPUT"Complete Level when you
die";a$
150 IF a$="n" THEN 170
160 POKE &A44C,0
170 INPUT"Infinite Lives";a$
180 IF a$="n" THEN 210
190 POKE &A462,0
200 LOAD"!",&C000
210 CALL &8200
```

Nicholas Pavis has also sent in Impossaball pokes: automatic placement on the next level when your time runs out, infinite lives, infinite time, removal of cylinders and a poke for pretty colours. Enter the listing using Method 1, omitting the pokes

you don't require. If you want the poke for infinite time, you cannot use the poke to place you on the next level once your time has run out.

```
1 ' Impossaball
2 ' by Nicholas Pavis
3 ' The Amstrad User July 87
10 OPENOUT"D":MEMORY &13FF
20 MODE 1:LOAD"!",&8000
30 CALL &8000
40 LOAD"!",&1400
50 LOAD"!",&C000
60 ' Time/Level poke
70 POKE &A45B,&CA
80 POKE &A45C,&4E
90 POKE &A45D,&91
100 POKE &A45E,0
110 ' Infinite lives
120 POKE &A462,0
130 ' Infinite time
140 POKE &962D,&C9
150 ' Remove cylinders
160 POKE &9C23,&18
170 ' Pretty colours
180 POKE &A3BB,&C9
190 CALL &8200
```

ALIENS

Unlimited ammunition and the ability to start in any room are two very useful pokes sent in by Paul Bosumworth. Entered using Method 1, it is just the tonic for Electric Dreams' gripping game.

```
1 ' Aliens
2 ' by Paul Bosumworth
3 ' The Amstrad User
10 MODE 1:BORDER 0:INK 0,0
20 INK 1,26
30 SYMBOL AFTER 256
35 OPENOUT"P":MEMORY &1FFF
40 DATA 0,26,6,20,17,18,1
43 DATA 25,15,03,16,13,13
44 DATA 22,14,13
45 LOAD"!scroll"
50 LOAD"!credits",&3000
60 CALL &8000
70 LOAD"!title",&3000
80 GOSUB 110:MODE 0
85 CALL &8000
90 LOAD"!loader":GOSUB 120
95 MODE 0:CALL &8000
100 DATA 0,6,16,25,0,0,0,0,
105 DATA 13,0,0,0,0,0,0,26
110 FOR n=0 TO 15:READ a
115 INK n,a:NEXT:RETURN
120 RESTORE 180
130 POKE 32931,118
135 POKE 32932,189
140 FOR a=33122 TO 33139
145 READ b:POKE a,b:NEXT
150 CLS:MODE 1
155 INPUT"ROOM (1-255)";n
```

```
160 IF n<1 or n>255 THEN 150
170 POKE 33128,n
180 DATA 33,147,27,54,0,62
190 DATA 1,33,59,02,119,33
200 DATA 79,2,119,195,64,0
210 RETURN
```

INHERITANCE

Chris Ball has solved the Infogrammes game and brings you this advice.

The hotel: Take the bag which will appear in the bottom right of the screen. Put the cursor on the bag and fire to open it. Put the cursor on the plate on the dressing table and some money will appear in the bottom left of the screen. Pick this up with the cursor and then open the drawers on the dressing table. Pick up the pen and the gun. Open the left cupboard and pick up the iron, candlestick, flowers, torch and necklace. Open the right cupboard and get the trumpet. Leave the room.

As you move through the floors of the building the characters you meet require these objects.

Old woman with purple hair wants the iron.

Chinese man wants the candlestick. Man with green lined suit and green hair wants flowers.

Man with glasses and pen behind his ear wants torch.

Man that looks like a waiter wants necklace.

Businessman wants pen.

Gangster wants gun.

Mick Jagger lookalike wants trumpet.

There are two other characters, a woman who gives you money and a man who you have to give money to. Once you've got rid of two objects go back to your room on the 17th floor (room 170) and get the passport and watch from the drawer. Head back down the building, returning objects until you reach floor zero. Here you can either grab a bike and cycle to the airport or phone for a taxi, but make sure it's got a driver before getting in (phoning makes the driver appear). The airport: Enter airport and turn right to the duty-free shop. Buy a sandwich and the newspaper Mon Tricot. Turn right twice till you face a man who when given some money will return your passport to you. Turn back to the information board you faced when you first walked in and wait for the 1120 Las Vegas flight to appear. Wait till the 1119 has gone off the board then turn left to a customs official. Give him your passport, wait for it to be returned then go through

the middle door.

On the plane a hijacker will appear. Give him the newspaper. At Las Vegas wait for the second number 9 bus and get on it, following screen instructions from there.

Las Vegas: This is the easy part - it's just a matter of time before you get a million.

SPACE HARRIER

An invincibility poke for Elite's super-fast shoot-em-up has been sent in by the never-sleeping Tony Hoyle. Entered using Method 1 it prevents you from dying when bumping into objects.

```
1 ' Space Harrier -- Tape
2 ' by Tony Hoyle
3 ' The Amstrad User July 87
50 MEMORY 35999
60 MODE 0
70 FOR a=0 TO 15
80 READ b
90 INK a,b
100 NEXT
110 BORDER 0
120 LOAD"!screen",49152
130 OPENOUT"d"
140 MEMORY 949
150 CLOSEOUT
160 LOAD"!block",950
180 POKE &D47,&C9
200 CALL 950
220 DATA 0,26,06,0,0,09
230 DATA 02,25,15,03,16
240 DATA 10,13,21,14,20
```

Jan-Mirko Maczewski has supplied you with invincibility for the disc version of Space Harrier. Just type in the listing and run.

```
1 ' Space Harrier -- Disc
2 ' by Jan Maczewski
3 ' The Amstrad User July 87
10 OPENOUT"x":MEMORY &3B5
15 CLOSEOUT
20 LOAD"elite",&8D6D
30 POKE &8DAB,&C9
40 CALL &8D6D
50 POKE &D48,&B7
60 FOR i=0 TO 2
70 POKE &D75+i,0:NEXT
80 CALL &3B6
```

THANATOS

Tips for Durell's dragon game come from Julian Thomlinson.

Men: don't really pose any problems, just have fun dropping them from a great height.

Birds: can be avoided by flying at full speed, moving up and down all the time. If one tries a dive, slow down and it will dive in front of you, allowing you to burn it.

Sea serpents: simply fly at full speed at the very top of the screen.

Falling rocks: can be avoided by flying very low at varying speeds - fast, slow, fast etc.

Giant spiders: are pretty nasty. As with the birds, fly fast and move up and down, don't slow down. If the girl is knocked off, land as quickly as possible and let her climb back on.

Two-headed dragon: after the second castle, fly along a bit, then land and start walking. As the dragon flies over, flame at him. If you hit he will land. Fly over him and burn again, then land. As he flies over again finish him off.

Panthers: appear just before the final castle. Either fly behind them and pick them up or burn them.

Refuelling: go back to find a witch between two stakes, land and then take off immediately. A knight will appear. Pick him off his horse, then land and eat the witch.

STARGLIDER

An excellent poke by Tony Hoyle (who seems to be going for a record-length listing) for Firebird's game. Entered using Method 1, it gives infinite everything (almost): energy, shields, laser fire, missiles, supermissiles. It even gives you a rear-view scanner at the start and the ability to fire when using it (which, incidentally, cannot normally be done).

A message Error in line xx likely means you made a mistake typing in data - the computer complains when it gets to line xx and tries to use the data.

There is a checksum at the end of each data statement: if you get Error in data then you probably entered one of the checksums incorrectly.

```
1 ' Starglider
2 ' by Tony Hoyle
3 ' The Amstrad User July 87
10 MEMORY &19FF
20 MODE 1
30 BORDER 0
40 WINDOW #1,15,27,10,10
50 WINDOW #2,15,27,13,13
60 x=&8000:t2=0:l=280
70 t=0
80 FOR j=0 TO 7
90 READ a$
100 a=VAL("&" + a$)
110 t=t+a
```

```
120 t2=t2+a
130 POKE x,a
140 x=x+1
150 NEXT j
160 READ c$:c=VAL("&" + c$)
170 IF t<>c THEN PRINT "Error in line ";l:END
180 l=1+10
190 IF x<&80E4 THEN 70
200 READ c$:c=VAL("&" + c$)
210 IF t2<>c THEN PRINT "Error in data":END
220 LOAD"!glider"
230 POKE &30,&C3
240 POKE &31,0
250 POKE &32,&80
260 POKE &1A6C,&F7
270 CALL &1A00
280 DATA 7a,fe,57,e5,c0,e1,3e,e9,057c
290 DATA 32,6c,1a,fd,e5,cd,e0,1a,0461
300 DATA cd,82,1a,cd,eb,1a,be,28,0421
310 DATA 07,06,00,cd,4a,1b,18,ed,0244
320 DATA 01,00,f6,ed,49,f3,e1,2e,042f
330 DATA 00,ed,5b,18,11,1a,ae,24,025d
340 DATA ae,25,12,2c,1c,20,f6,ed,0330
350 DATA 5b,18,11,21,40,01,1a,ae,01ae
360 DATA 77,1c,2c,20,f9,cd,37,bd,0399
370 DATA ed,5b,18,11,2a,1a,11,1a,01e0
380 DATA ae,77,23,1c,20,f9,3a,1d,02d4
390 DATA 11,bc,20,f3,cd,00,30,fb,03d8
400 DATA 3e,01,cd,b4,bb,3e,03,cd,0389
410 DATA 96,bb,3e,02,cd,b4,bb,3e,040b
420 DATA 03,cd,96,bb,21,82,80,11,0355
430 DATA 80,00,01,61,00,ed,b0,c3,0342
440 DATA 80,00,3e,39,01,02,01,cd,01c8
450 DATA 00,1c,01,01,01,cd,38,bc,01e0
460 DATA 3e,0f,01,00,00,f5,cd,32,0242
470 DATA bc,f1,3d,fe,ff,20,f3,01,04fb
480 DATA 10,27,0b,78,b1,20,fb,3e,02c4
490 DATA 3a,cd,00,1e,af,32,fa,37,0337
500 DATA 32,fb,37,32,09,38,32,0a,0213
510 DATA 38,32,19,38,32,1a,38,
```

```

32,0171
520 DATA 8f,58,32,9c,61,32,0a,
63,02b5
530 DATA 32,0b,63,32,37,63,32,
38,01d6
540 DATA 63,32,64,63,32,65,63,
32,0288
550 DATA f6,64,32,f7,64,32,07,
65,0385
560 DATA c3,1e,11,00,00,00,00,
00,00f2
570 DATA 55ea
    
```

SUPER ROBIN HOOD

This Codemasters cheapo has been given the once-over by Peter Featherstone. A super Super Robin Hood is what you get - he's invulnerable. The poke is entered using Method 1.

Peter informs us that there is an in-built cheat for the game. It does one of three things: increases your health by 10, sets all the lifts into action without the use of the keys, gives you all the hearts necessary to complete the game.

To use the cheat you must start playing the game; at any point after that press the keys 6, A and P simultaneously. The computer will call you a cheat. Pressing E will give you extra health (or energy); K sets the lifts into action and H collects all the hearts. The required key should be held down until play resumes - the border will change colour to signify the cheat is operative.

```

1 ' Super Robin Hood
2 ' by Peter Featherstone
3 ' The Amstrad User July 87
20 FOR f=&BE00 to &BE07
30 READ a$
40 POKE f,VAL("&"a$)
50 NEXT f:LOAD""
60 POKE &AC92,0
70 POKE &AC93,&BE
80 CALL &AC01
90 DATA 3E,C9,32,91
95 DATA 6C,CD,D0,76
    
```

Ian Grainger has also been busy poking around Robin Hood: extra speed and infinite health are his speciality. The poke, entered using Method 1, has an interesting side-effect: spiders can be used as convenient lifts. One final tip sent in by Ian: typing PANDA in the high-score tables gets an interesting message.

```

1 ' Super Robin Hood
    
```

```

2 ' by Ian Grainger
3 ' The Amstrad User July 87
10 MEMORY &1CEB:MODE 0
20 BORDER 0
30 RESTORE 290
90 add=&A540
100 WHILE add<&A55F
110 READ a$
120 POKE add,VAL("&"a$)
130 add=add+1
140 WEND
160 RESTORE 340
170 col=0
180 WHILE col<16
190 READ a,b:INK col,a,b
200 col=col+1
230 LOAD"!robpict",&C000
240 LOAD"!robin1",&1CEC
245 ' Speed
250 POKE &6122,0
255 ' Health
260 POKE &6C98,&C9
270 CALL &A540
290 DATA 06,06,21,57,A5,11
300 DATA 00,10,CD,77,BC,21
310 DATA 40,00,CD,83,BC,CD
320 DATA 7A,BC,CD,D0,76,72
330 DATA 6F,62,69,6E,32,00
335 DATA 00,00
340 DATA 0,0,26,26,6,6,18
350 DATA 18,9,9,26,26,6,6
360 DATA 18,18,13,13,0,06
370 DATA 0,18,18,24,24,03
380 DATA 3,16,16,23,23
    
```

XCEL

Here is a classy set of pokes from John Blackburn. Entered using Method 1, it gives infinite shuttles, 100% shields, prevents flying aliens from shooting and even fixes a bug, allowing the shuttle to move diagonally north-east when you use the keyboard. You can also choose the type of game you wish to play: either maze-only or alien-zapping - remove the data you don't require.

John has also provided a few hints: It isn't necessary to decode the alien messages - they probably don't mean anything (apart from the decimal counter).

The 30 computer bases you have to reach are at the following locations:

9	2	39	1	68	3
17	2	42	3	73	3
19	3	45	3	75	1
21	2	49	2	78	2
22	3	50	1	83	2
24	3	51	1	84	1
25	1	55	3	88	2

28	2	58	3	89	3
32	1	63	3	94	3
37	3	67	2	98	2

Select map. Move arrow with cursor keys or joystick. Press Enter to return to TV mode. Enter again to hyperspace. Del to launch shuttle.

```

1 ' Xcel
2 ' by John Blackburn
3 ' The Amstrad User
4 ' July 87
10 MEMORY &9BFF
20 LOAD"!",&9C00
30 i=&9C1E
40 WHILE a$<>"ff"
50 READ a$
60 POKE i,VAL("&"a$)
70 i=i+1:WEND:CALL &9C00
80 DATA 3e,c9,32,26,32,cd
90 DATA 00,30,21,ce,07,11
100 DATA d0,93,3e,15,cd,a1
110 DATA bc,3e,00,32,a4,33
120 DATA 3e,c9,32,25,41,21
130 DATA 00,00,22,2d,55,21
140 DATA cb,47,22,84,2a
150 ' Maze only
160 DATA 3e,c9,32,ce,24
170 ' alien-zap only
180 DATA 3e,b4,32,74,23
190 DATA c3,5d,6a
200 DATA ff
    
```

DEEP STRIKE

Peter Featherstone has been kind enough to supply your Deep Strike fighter and bombers with armoured propellers. Not only that you have an unlimited supply of bombers. The poke is entered using Method 2 - wind the cassette past the block named DEEP then run the poke listing.

```

1 ' Deep Strike
2 ' by Peter Featherstone
3 ' The Amstrad User July 87
10 BORDER 0:INK 0,18
11 INK 1,26:INK 2,6
12 INK 3,2:MODE 1
20 OPENOUT"Y":MEMORY 999
30 OUT &BC00,1:OUT &BD00,32
40 OUT &BC00,2:OUT &BD00,42
50 OUT &BC00,6:OUT &BD00,24
60 FOR f=&BE00 TO &BE23
70 READ a$
80 POKE f,VAL("&"a$):next
90 CALL &BE00
100 DATA 21,00,86,11,64,00
110 DATA 3E,16,CD,A1,BC,21
120 DATA 14,BE,22,47,86,C3
130 DATA 00,86,3E,C9,32,E0
140 DATA 57,32,77,57,AF,32
150 DATA 29,57,CD,98,23,00
    
```

1942

The hacker Phil Howard, has sent in a batch of "I don't know whether I really want to cheat" cheats. Enter by Method 1, and the Roll key is now the spacebar rather than 1. You also have infinite rolls and auto-repeat firing. Attain extra lives by pressing the + key - what else?

```

1 ' 1942
2 ' by Phil Howard
3 ' The Amstrad User July 87
10 DATA 21,00,05,11,58,02
20 DATA 01,10,A4,ED,B0,21
30 DATA BE,02,36,2F,AF,32
40 DATA BF,02,32,95,29,21
50 DATA 20,BE,22,E6,0F,C3
60 DATA B3,89,CD,1E,BB,C0
70 DATA 3E,1C,CD,1E,BB,C8
80 DATA 3E,05,32,C0,24,21
90 DATA 28,C1,CD,CC,26,E1
100 DATA C3,0E,0F
110 Y=0:OPENOUT"Y"
120 MEMORY &4FF
130 FOR X=&BE00 TO &BE38
140 READ A$:A=VAL("&" + A$)
    
```

```

150 POKE X,A:Y=Y+A:NEXT
160 IF Y<>&1601 THEN 190
170 LOAD"1942",&500
180 CALL &BE00
190 PRINT"DATA ERROR!"
    
```

IKARI WARRIORS

Someone known only as Mark has supplied a poke for Elite's multi-player (well two-player actually) shoot-em-up. Infinite lives are up for grabs. Owners of the cassette version will be glad to know that a Method 1 entry will let you use this poke.

```

1 ' IKARI WARRIORS
2 ' by Mark
3 ' The Amstrad User July 87
20 MODE 1
30 OPENOUT"Y"
40 MEMORY &12BF:CLOSEOUT
50 INPUT"lives (1-255)";v
60 IF v<1 OR v>255 THEN 50
70 LOAD"!SCREEN"
80 LOAD"!WARRIORS"
90 POKE &6EAB,v
100 POKE &692A,111
    
```

```
100 CALL &FFD0
```

MOON CRESTA

Have you wanted an increased docking time for Incentive's coin-op game? Roger "I've become addicted to hacking" Payne has found just the poke (entered via Method 1). It gives you 99 seconds to complete docking, allowing bonuses around the 10,000 mark, rather than the more usual 2,000.

```

1 ' Moon Cresta
2 ' by Roger Payne
3 ' The Amstrad User July 87
10 MEMORY &9FFF
20 LOAD"cresta"
30 POKE &A09F,&10
40 POKE &A0A0,&A1
50 FOR a=&A110 TO &A117
60 READ a$
70 POKE a,VAL("&" + a$)
80 NEXT a
90 DATA 3e,30,32,1a
95 DATA 56,c3,c2,74
99 CALL &A000
    
```

NEW! from NEMESIS

BONZO SUPER MEDDLER is a dedicated Tape to Disc utility. Transfers standard Basic, Binary and ASCII files. Able to cope with some headerless files & some flash loaders. Comes with comprehensive instructions and additional utilities.

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BONZO DOO DAH . . . Allows formats of 203k per side of disc. Copies files between standard and large formats. Sector editing with facility to search for specific strings entered in either ASCII or HEX. Full directory editing facilities as well as providing details on sector formats and file locations. Disc to Disc copy will clone enhanced (large) or standard formats on single or twin drive systems. BDD will apparently back-up your copy of TRIVIAL PURSUITS or EIDOLON, something which is a first for software back-up utility. More than useful, Doo Dah is enjoyable to use.



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LITTLE COMPUTER PEOPLE

"If your Little Computer Person is a balding old fogey who always wants to play the piano, the LCP Eviction Kit is what you need."

Thanks, Peter Featherstone.

Please note that this poke does alter the game disc. This means that if you enter it incorrectly you may damage the program. You should make very sure you've typed it in correctly - we bear no responsibility for any mistakes. Alternatively, you could make a backup copy of LCP onto another disc. Type in and run the listing; the LCP disc will run as normal, but your old LCP will have been evicted - a new one taking its place.

```

1 ' LCP
2 ' by Peter Featherstone
3 ' The Amstrad User July 87
20 MEMORY &1FFF
30 LOAD"BOOT"
40 POKE &8020,&FB
45 POKE &8021,&C9
50 CALL &8000
60 POKE &20C3,0
65 POKE &251A,0
70 POKE &2DD2,0
80 CALL &2000
    
```

ELITE COMPLETE

Yes, there have been lots of Elite pokes in the past. No, these are not reprints of them. C. Thomas, after weeks of hex-sifting, has brought you a comprehensive list of pokes for the disc version of this epic game.

The list of options you can alter is long: kept in REM statements, they tell you exactly what each poke will do. It is best to remove the lines in the listing that you do not require. Note that the poke for infinite cargo-bay size needs to alter one file on the Elite disc - be very careful when typing this part of the listing.

And by the way, this is the last Elite poke you will see. After you look at these, we think you'll agree: there's nothing else you can do.

```

1 ' Elite - disc
2 ' by C. Thomas
3 ' The Amstrad User July 87
40 MODE 1:BORDER 0:INK 0,0
50 INK 1,24:INK 2,15:INK 3,6
60 WINDOW #1,14,26,12,12
70 WINDOW #2,14,26,14,14
80 LOAD"picture",&C000
90 OPENOUT"D"
    
```

```

100 MEMORY &83F
110 CLOSEOUT
120 LOAD"largeaxx",&840
130 LOAD"commonxx",&1A40
140 LOAD"common2x",&C000
150 ' ** THE POKES **
160 ' INFINITE FUEL
170 POKE &4F02,0
180 ' INFINITE MISSILES
190 POKE &382D,0
200 'NO HYPERSPACE RANGE LIMIT
210 POKE &4C08,0:POKE &4C12,0
220 ' CONSTANT GALACTIC HYPERJUMP
FACILITY
230 POKE &4BFA,0
240 ' CONSTANT ESCAPE POD
250 POKE &3849,0
260 ' NO CARGO LOSS ON USE OF
ESCAPE POD
270 POKE &3866,0
280 ' NO ENERGY LOSS
290 POKE &35CB,0
300 ' NO LASER TEMPERATURE RISE
310 POKE &7A4F,0
320 ' ONE HIT TO DESTROY ENEMY
SPACESHIPS
330 POKE &7AA8,0
340 ' SPACE STATIONS LAUNCH
THARGOID SHIPS
350 POKE &896B,0
360 ' MISSILES ARE ABLE TO BLOW UP
SPACE STATIONS
370 POKE &8A8F,0
380 ' CLOAKING DEVICE (Y-KEY)
390 POKE &4902,&21:POKE &4906,&F6:
POKE &4908,0
400 ' INFINITE CREDITS
410 POKE &FE78,3:POKE &FE86,&18
420 ' ECM SYSTEM JAMMER
430 POKE &8932,&18:POKE &48C3,0
440 POKE &48CD,0
450 ' CONSTANT ENERGY BOMB
460 POKE &2F6A,0
470 'REMOVE BLINDING FLASH FROM
ENERGY BOMB
480 POKE &2F7A,&C9
490 ' MAKE YOURSELF INDESTRUCTIBLE
500 POKE &787C,0:POKE &7B61,0:POKE
&1E63,&C3
510 ' START PROGRAM
520 CALL &1C82
530 '
540 ' THIS BIT GIVES YOU INFINITE
CARGO CAPACITY. It does alter one
of the files on your disc - take
care with typing and ensure the
write protect tab ioff. If you
want the option,type GOTO 550
550 OPENOUT"y":MEMORY &83F
560 CLOSEOUT
570 LOAD"largeaxx",&840
580 POKE &998,0
    
```

```

590 a$="largeaxx.bin":|ERA,@a$
600 SAVE"largeaxx",b,&840,&1200
610 ' IF YOU WISH TO PUT THE
PROGRAM BACK INTO ITS ORIGINAL
FORM USE THE SAME AS ABOVE.
JUST CHANGE POKE &998,0 TO POKE
&998,&19
    
```

HOWARD'S WAY

Phil Howard as departed from his usual poking practices and found some tips that don't require pokes at all.

Impossaball: on the starting screen press the keys CHEAT together, then press L to change the start level.
Ghost Hunter: at any time press Del to pause the game, then type COMPLEX. This will put you into the cheat mode and restore the energy bar. By pressing different letter keys it is possible to move from room to room. Pressing Enter restarts the game, pressing Space restarts the game and activates the lifts.
Killapede: at any time pause the game by pressing Delete, then press keys A6P together to increase lives. Restart by pressing Clear.

POKE METHODS

Here is how to input the majority of Cheat Mode pokes. The instructions for each poke tell you which of the two different methods to use. If you have a 664 or 6128, you'll have to type | tape before typing either.

Method 1

Make sure that you've rewound the game tape to the beginning. Now type in the poke listing. Then type RUN and press the Enter key. (Don't use the key marked CTRL or Control; that would stop the poke from working). Press the Play key on the cassette deck, and then any key on the main keyboard - the spacebar will do nicely. The tape should now start to play through in the normal way.

Method 2

For this method, you have to skip the first bit of the game program. To do that, start by rewinding the game tape to the beginning. Now type in the listing. Then type CAT and press Enter. Start the tape by pressing Play and then any key. Then watch the screen.

After a little while you'll get the message Found something block 1. It doesn't matter what the something actually is; this will vary from one game to another. If the instructions with the poke just tell you to skip the first block, you should stop the tape here.

If the instructions tell you to skip several things, stop the tape when the Found message comes up for the last thing you're trying to skip.

Once you've stopped the tape, press Escape,type RUN and press Enter. Now press Play on the tapedeck and any key on the keyboard to start the tape running.

Sentinel and Leader Board

Reviews by Ian Barnes and Norm Wilson

THE SENTINEL - Firebird Gold/ISD

Are you tired of platform and ladder games; have you shot so many invaders from outer space that you think that you depopulated the known universe; have you seen so many semi-3D isometric games that you have nightmares about how to orientate your joystick so that Alien-8/Sweervo/Batman/Dexter will not hit the Eggs/Pineapple/Bowling Balls etc. etc. ad nauseam? In short are you bored witless by all those games that just seem to take a good idea and reuse it again and again? Then you need a change. You need something that is completely new, completely different, and a real challenge. You need The Sentinel.

The Sentinel consists of 10000 landscapes, each one unique. On each landscape there can be a number of things including trees (1 point of energy), boulders (2 points of energy), robots (3 points of energy), and the sentinel and sentries (4 points of energy). The player has control over a single robot, and is presented with a full screen view of the landscape drawn in TRUE three dimensional perspective graphics, as seen from this robot. These graphics are a bit slow to draw up, but are truly stunning, and leave anything else on the AMSTRAD for dead. Each landscape is on a 32 by 16 grid, and originally contains your robot, the sentinel, a number of sentries (except in the first few rooms) and a fair number of trees. When you first enter a landscape you are given an aerial view of the whole landscape. Examining this will help you to orientate yourself later. (By the way, if this review is a bit confusing, it is because the game is very hard to describe.)

The sentinel stands on top of a tower

overlooking the landscape. You control a robot who must absorb the sentinel, take over his tower, and then transport itself to the next landscape. The sentinel, slowly rotates around, looking at about a 30 degree slice of the landscape at once. When he looks in a new direction, he will examine every square of the landscape in this direction looking for energy. Trees, which have only one point of energy, are the only things safe from his gaze. If the sentinel has a line-of-sight view of any square with more than one point of energy on it, he will sap energy from it. Energy is taken one unit at a time until it is down to one unit, with the sentinel creating trees at random over the landscape to keep the amount of energy in the landscape constant. Sentries operate in the same way, but they are on lower hills, and so can be more easily absorbed by the player.

The most important thing to do is to grab as much energy as you can so that if you get in trouble you have energy to run away. Since your robot has all the energy that you have carefully picked up, the sentinel thinks that Christmas has come early if it spots you. It will sit there contentedly sucking energy out of you until you lose all of your extra energy, and then turns you into a boulder which is not too healthy at all, as it kills you. The only thing to do here is cut your losses, create another robot somewhere else and transfer to it, then turn around and try to salvage the remnants of your old robot. Of course, if a sentry is looking at your new square you will have to move again, and will probably lose the energy from both old robots. If the sentinel or a sentry can see you but not the square you are standing on then it will flush you out by turning a nearby tree into a Meanie, which rotates



**NEW For AMSTRAD
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The **VIN-STEM DISC ORGANISER** is a multi-function file database system which not only allows you to keep track of your programs, files and discs but will also prepare disc jacket inlays to make disc and file selection easy. The **VINSYSTEM** consists of five separate utilities, all accessed from the main menu by a single key stroke program choice.

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- 3. VINPRINT** allows quick and easy printer font setting. 20 different line spacings, italics, expanded, compressed etc.
- 4. VINMENU** automatically records a menu selection program onto your disc. Run 0 will give you a single key stroke program choice.
- 5-6. VINCAT** both are used to print a disc jacket inlay with a list of files on disc. V2 gives a larger print title than V2 program.

VIN-STEM MATHS 1 New, fabulous **MATHEMATICS DICTIONARY** can do homework for you, contains geometry of CIRCLE, SEGMENT, ANNULUS, -CRYSTALS, TETRA, HEXA, OCTA, DECA, ICOSAHEDRONS, -3D OBJECTS, CUBOIDS, PYRAMIDS, CONES, CYLINDERS, 5 combinations of TRIANGLE angles and sides, -SPHERES, SEGMENTS, CONES, ZONES, -POLYGONS, TRI, QUAD, PENTA, HEXA, HEPTA, OCTA, DECAGONS. The 'MATHS 1' solves the problems, not just playing with numbers. Excellent graphics show problem graphically.

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around quickly until it can see you, then hyperspaces you. You can also hyperspace yourself if you get in trouble, but this dumps you somewhere at random, and usually seems to put you in a different spot so only use it in an emergency.

Before the player can absorb or create an object, you must have a line-of-sight on the upper surface of the square on which the object is standing/will stand. Simply pan the view around to the target square, line the sights up and press the appropriate button. The exception to this is a square with a boulder on it, in which case the boulder acts as an extension of the surface of the square. The robot can create trees, boulders and other robots. Your robot is fixed in position, and so the only way to move is to create a new robot and transfer to it. (The instructions incorrectly state that you use T to transfer, it is in fact Q.) If the new robot is created on top of a few boulders, you will gain height. When you are high enough, (you will have to be standing on at least one boulder, on top of the highest place on the landscape) you will be able to see the top surface of the tower on which the sentinel stands. Absorb him, build a robot on his tower and transfer across, and then press hyperspace to gain the password for your next level.

The next level you go to is determined by the amount of energy you have left. This is displayed in the corner of the screen in the form of how many trees, boulders and robots you can make with the energy you have. Try to absorb as many trees as possible before absorbing the sentinel, as you cannot absorb any energy after this. Also remember to absorb your old robot after you transfer, as you need all the energy you can get. The different levels with passwords means that you can play one or many levels, depending on the time you have. Remember to write down the passwords somewhere and you can come back weeks later and continue from where you left off. The higher levels really get difficult, I have had one room with 7 sentries and the sentinel looking for me. This game is a refreshing change and is unlike anything you have seen before. The game-play may be very slow due to the

enormous number of calculations that this program must be doing, but once you start playing, other games pale into insignificance.

Ian Barnes

LEADER BOARD - Access Software/Imagineering

Being a Golf Player of years back and having the frustration of not getting to the golf course, I decided to invest in Leader Board which I had originally seen on my nephew's Commodore. After pestering the importers of the game (Imagineering) to send a copy to my dealer when stocks landed, it finally arrived. I rushed home with the disc, stuck it in the disc drive (it loads heaps faster than the Commodore), and when it wouldn't work I read the instructions - always a good thing to do - after which I successfully loaded the Game. Incidentally, I put the instructions in the "pretty good" category.

I have a green screen monitor and all you get is varying shades of green (*isn't that the same colour as grass? - Ed*), but it does present much better on the colour monitor. There are 4 courses from which to choose and you can play in a foursome, threesome, pairs or by yourself. There are 72 hole, 54 hole, 36 hole and 18 hole games and you can play them in any order you wish. The levels of the standards of the golfers can also be placed in the computer; Novice, Amateur and Professional. The abilities of the players once locked in cannot be changed after playing the first hole, much to my disgust. I put in Professional and after 13 on the first hole I decided this is not for me and wanted to go back to the clubhouse and put my clubs in the boot of the car and spend time at the nineteenth. Seriously though, the game's pretty close to the real thing.

Once loaded and on pressing the fire button the 1st hole is drawn; first of all the teeing area then the rest of the hole. You hit from the tee over water to a green fairway. The computer gives you the distance to the hole and a club selection panel is displayed on the right of the screen. You select the club then press the fire button after adjusting the direction with a little

square above the golfer's head. The ball flies through the air and you watch it (and it's shadow) until they meet on the ground. If your shot was full strength you will make it over the water and onto the fairway. The computer adjusts to the view of the next shot from where the ball has landed and gives you the distance to the pin. Once again you select the club for the shot and watch it fly onto the green. As long as your ball is within 64 feet of the hole you are on the green.

Once again the computer adjusts to the golfer standing on the green, tells you the distance of the putt and a stick on the right of the screen indicates the slope of the green either uphill, downhill etc. The score for each player is then placed on the scoreboard at the completion of the hole, and so on till the end of the round.

The little animated golfer has a good swing, better than some I have seen on the golf course. The full use of the Amstrad colours are not utilised, the most glaring example is the ball; it's black. The new colours are either red, yellow or orange golf balls; I have never seen a black one yet. Some closer attention to detail in this conversion would have cleared up this fault and one gets the impression that it was converted all too hastily. On the other hand, it I hadn't have seen the Commodore version I would never have known.

Overall the game's a good one, but take my advice, if you have a green monitor forget it. The colour is so much more realistic on the colour monitor, but until someone comes up with a modulator for the colour T.V. you'll just have to be satisfied with what you've got.

Norm Wilson

the SENTINEL

is available through
The Amstrad User on
tape at \$34.95 (post free)
Discs available very soon.
See Page 64.

Gallimaufry IV

You're in for a real treat this month with two very clever graphics demos pushing the Amstrad to its limits plus a truly amazing three channel Drum-kit synthesiser.

DRUMKIT

A fantastic drum-kit synthesiser which will transform your Amstrad into a surprisingly good rhythm unit.

You can switch among three grids, one for each of the Amstrad's sound channels. Each of the 48 vertical lines in the grid marks a different beat. The up and down cursor (arrow) keys will get you to the required sound; left and right will move you to a different beat.

All three channels will play simultaneously while the program is running, so any changes you make will be instantly audible. Pressing the F or S key will cause the rhythm to be played faster or slower.

One other nice feature is that you can save your creations to cassette or disc and later load them back in.

```

1 ' AMSTRAD DRUMKIT
2 ' J'Keneally
3 ' The Amstrad User July 87
10 MODE 2:GOSUB 200:GOSUB 630
20 EVERY itime GOSUB 750
30 imd=0
40 a$="":LOCATE 35,3:PRINT"Beat:";ix:WHILE a$="":a$=INKEY
$
50 LOCATE 13+ix,16-irythm(ix,ichan)
60 PRINT CHR$(143+imd);imd=(imd+1) AND 1
70 WEND
80 a$=UPPER$(a$):IF a$="S" OR a$="F" THEN GOSUB 800:GOTO
40
90 IF a$="C" THEN GOSUB 820:GOTO 40
100 IF a$="L" THEN GOSUB 840:GOTO 40
110 IF a$="W" THEN GOSUB 910:GOTO 40
120 IF a$="R" THEN GOSUB 1000:GOTO 40
130 LOCATE 13+ix,16-irythm(ix,ichan)
140 i=ASC(a$):PRINT CHR$(159+16*(i=243 OR (i=242)));:
150 ii=irythm(ix,ichan)
160 irythm(ix,ichan)=i1-(i=241)*(i1>0)+(i=240)*(i1<11)
170 ix=ix+(i=243)*(ix<47)-(i=242)*(ix>0)
180 GOTO 40
190 REM
200 REM Initialise
210 DEFINT i:DIM irythm(47,3),itone(11),ienv(11),ient(11)
,noise(11),name$(11)
220 RESTORE 230
230 DATA 0,1,0,15,Wood Block
240 DATA 18,5,3,13,Guiró
250 DATA 80,3,0,0,Cowbell
260 DATA 0,4,0,2,Hi Hat
270 DATA 150,6,4,1,Cymbal
280 DATA 200,3,1,13,Snare
290 DATA 480,1,2,10,Tom 4
300 DATA 375,1,2,15,Tom 3
310 DATA 325,1,2,6,Tom 2
320 DATA 240,1,2,3,Tom 1
330 DATA 870,3,1,31,Bass Drum
340 FOR i=1 TO 11
350 READ itone(i),ienv(i),ient(i),noise(i),name$(i)
360 NEXT i
370 FOR i=0 TO 47:READ irythm(i,0):NEXT
380 DATA 10,10,6,6,11,0,11,0,5,0,6,5,11,0,11,4
390 DATA 10,10,6,6,11,0,11,0,5,0,6,5,11,0,11,4
400 DATA 10,10,6,6,11,0,11,0,5,0,6,5,11,0,11,4
410 irythm(5,1)=1:irythm(16,1)=2:irythm(34,1)=3:irythm(36
,1)=3
420 irythm(0,1)=3:FOR i=44 TO 47:irythm(i,1)=3:NEXT
430 irythm(2,2)=1:irythm(19,2)=1:irythm(20,2)=1
440 itime=6:ichan=0:ix=0
450 ind=0
460 ENT 1,1,-100,1,5,25,3
470 ENT -2,1,-75,1,4,25,3
480 ENT -3,1,4,2,1,-8,2,1,4,2
490 ENT -4,4,4,1,4,-4,1
500 ENV 1,1,15,2,5,-3,4
510 ENV 2,1,15,1,15,-1,2
520 ENV 3,1,15,1,4,-2,2,7,-1,4
530 ENV 4,7,2,1,14,-1,4
540 ENV 5,1,15,1,15,-1,0
550 ENV 6,2,7,1,1,0,20,14,-1,10
560 LOCATE 12,18:PRINT"S,F=Slow/Fast. C=Channel. L=Load.
W=save .R=Reset."
570 LOCATE 23,21:PRINT STRING$(21,143)
580 LOCATE 23,25:PRINT STRING$(21,143)
590 FOR i=1 TO 3:LOCATE 22,21+i:PRINT CHR$(143);TAB(44);C
HR$(143):NEXT i
600 LOCATE 26,23:PRINT"AMSTRAD DRUMKIT"
610 RETURN
620 REM
630 REM Write frame
640 ifs=16:name$(0)="Silence"
650 FOR i=0 TO 11:LOCATE 2,ifs-i
660 PRINT name$(i);TAB(13);STRING$(40,159)
670 NEXT i
680 FOR i=0 TO 47:LOCATE 13+i,ifs-irythm(i,ichan)
690 PRINT CHR$(143);:NEXT i
700 PLOT 95,398-16*ifs:DRAWR 386,0
710 DRAWR 0,194:DRAWR -386,0:DRAWR 0,-194
720 LOCATE 20,3:PRINT"Channel No.":ichan
730 RETURN
740 REM
750 REM Play rythm

```

```

760 FOR iz1=0 TO 2
770 iz=irythm(ind,iz1):IF iz<>0 THEN SOUND 129+iz1,itone(
iz),1000,0,ienv(iz),ient(iz),noise(iz)
780 NEXT
790 ind=(ind+1) MOD 48:RETURN
800 IF a$="S" THEN itime=itime+1 ELSE itime=itime+(itime
>1)
810 EVERY itime GOSUB 750:RETURN
820 ichan=(ichan+1) MOD 3:GOSUB 630:ix=0:RETURN
830 REM
840 REM Load
850 GOSUB 960
860 CLS#1:PRINT#1,"Loading."
870 OPENIN"!rythm"
880 FOR i=0 TO 47:INPUT #9,irythm(i,0),irythm(i,1),irythm
(i,2)
890 NEXT i:CLOSEIN:EVERY itime GOSUB 750
900 CLS#1:GOSUB 630:ix=0:RETURN
910 REM Save
920 GOSUB 960:OPENOUT"!rythm"
930 CLS#1:PRINT#1,"Saving."
940 FOR i=0 TO 47:FOR i1=0 TO 2:PRINT #9,irythm(i,i1):NEX
T i1:NEXT i
950 CLOSEOUT:CLS#1:EVERY itime GOSUB 750:RETURN
960 i=REMAIN(0):WINDOW#1,65,80,10,15
970 PRINT#1,"Load tape,":PRINT#1,"press a key."
980 WHILE INKEY#<>"":WEND:WHILE INKEY#="":WEND
990 RETURN
1000 REM Reset Channel Routine
1010 j=-1:i=REMAIN(0):WINDOW#1,65,80,10,15:CLS#1
1020 PRINT#1,"Reset Channel":PRINT#1,"Number (0/1/2)~?"
1030 WHILE j=-1
1040 IF INKEY(64)=0 THEN j=1
1050 IF INKEY(65)=0 THEN j=2
1060 IF INKEY(32)=0 THEN j=0
1070 WEND
1080 CLS#1
1090 FOR k=0 TO 47:irythm(k,j)=0:NEXT k:GOSUB 630
1100 EVERY itime GOSUB 750:RETURN
1110 REM End of Reset

```

BLITTER

This program mimics certain high-powered - and higher priced - micros with their exceedingly fat graphics capabilities. The demo is of a huge red and white ball, constantly rotating and bouncing around a grid background. After you have watched in amazement for a while, you may wonder how on earth Paul manages this mighty feat with only 3k of Basic.

The secret is that rather than moving the ball around, he moves the whole screen. This is an in-built hardware feature of the Amstrad and can be carried out gracefully and effortlessly.

Be patient - it takes a while to construct the picture but the wait is well worth it.

```

1 ' Blitter
2 ' Paul Bond
3 ' The Amstrad User July 87
10 a=0.2
20 x=120
30 DEG
40 c%=3
50 c1%=9
60 MODE 0
70 FOR x%=&C000 TO &F7FF STEP 2:POKE x%,128:NEXT
80 FOR x%=&F800 TO &FFFF:POKE x%,192:NEXT
90 GOSUB 310:ORIGIN 0,0,0,640,0,400
100 col=i
110 FOR kkk=1 TO 100
120 FOR kk=1 TO col
130 x=x-4
140 IF x=0 THEN a=-0.2
150 IF x=-120 THEN GOTO 290
160 d=0
170 PLOT 320,300,1
180 FOR t%=90 TO 270 STEP 4
190 chk=INT(200+100*SIN(t%))
200 IF chk=293 OR chk=243 OR chk=156 OR chk=106 THEN d=1
210 IF chk=276 OR chk=203 OR chk=128 THEN d=0
220 IF d=1 THEN DRAW 320+x*COS(t%),200+100*SIN(t%),c% ELS
E DRAW 320+x*COS(t%),200+100*SIN(t%),c1%
230 NEXT t%
240 NEXT kk
250 col=col+a:c%=c%+1:c1%=c1%+1
260 IF c%=15 THEN c%=3
270 IF c1%=15 THEN c1%=3
280 NEXT kkk
290 GOTO 420
300 END
310 c=15
320 x%=0:y%=100:ORIGIN 380,200:PLOT -2,-2,c
330 d%=3-2*r
340 WHILE x%<y%+2
350 PLOT x%,y%:DRAW -x%,y%:PLOT y%,x%:DRAW -y%,x%:PLOT -x
%, -y%:DRAW x%, -y%:PLOT -y%, -x%:DRAW y%, -x%
360 IF d%<0 THEN d%=d%+4*x%+6:GOTO 390
370 d%=d%+4*(x%-y%)+10
380 y%=y%-2
390 x%=x%+2
400 WEND
410 RETURN
420 d=2
430 ENV 1,14,-1,2
440 ENT 1,100,5,1
450 dr=1:c1=3:c12=9:fr=1:xd%=-1:yd%=-0.5:x%=30:y%=15
460 FOR X=2 TO 14 STEP 2:INK x,6:INK x+1,26:NEXT
470 INK 15,1:INK 1,2:INK 0,11: BORDER 11
480 WHILE mainloop=0
490 INK c1,6:INK c12,26

```

```

500 OUT &BC00,12:OUT &BD00,48+INT(t%/256):OUT &BC00,13:OU
T &BD00,t% MOD 256
510 IF x%>35 OR x%<15 THEN IF xd%=-1 THEN SOUND 1,1500,0,
1,1,1 ELSE SOUND 4,1500,0,1,1,1 ELSE a=a
520 yd=yd-0.5:x%=x%+xd%
530 IF x%>35 OR x%<15 THEN xd%=-xd%:dr=-dr
540 t%=x%+(80*y):FOR a=1 TO d:CALL &BD19:NEXT
550 y=y+yd:IF y<11 THEN yd=2.5
560 IF yd=2 THEN SOUND 2,1000,0,1,1,1
570 c1=c1+dr:IF c1=15 THEN c1=3 ELSE IF c1=2 THEN c1=14
580 c12=c12+dr:IF c12=15 THEN c12=3 ELSE IF c12=2 THEN c1
2=14
590 WEND

```

PSYCHEDELIC STROBE

Stephen Stokes has sent in a listing written in machine-code. The results are most satisfying if the cassette input is plugged into the headphone socket of a music system. Run the program. Setting up the machine-code and initial screen pattern takes a few minutes. Plug the cassette lead into the music system. If nothing happens increase the volume: increasing the volume will result in faster and brighter patterns. Effects are best in a darkened room. Pressing any key will halt the program.

```

1 ' Psychedelic strobe
2 ' by Stephen Stokes
3 ' The Amstrad User July 87
20 '
30 '**MACHINE-CODE LOADER **
40 '
50 FOR AD=32768 TO 32907 STEP 10
60 CHECKSUM=0:FOR AD2=AD TO AD+9
70 READ V$
80 N=VAL("&"+V$)
90 POKE AD2,N
100 CHECKSUM=CHECKSUM+N
110 NEXT AD2
120 COUNT=COUNT+1:READ CH$:IF VAL("&"+CH$)<>CHECKSUM THEN
PRINT"Checksum error in line";COUNT*10+130:END
130 NEXT AD
140 DATA 3E,00,32,4E,80,3C,32,4F,80,01,27C
150 DATA D0,F5,2E,1A,ED,78,FE,DE,28,04,57A
160 DATA 3E,01,18,02,3E,00,F5,D1,3A,4E,2E5
170 DATA 80,82,32,4E,80,3E,00,03,2D,BD,32D
180 DATA 28,02,18,E2,2E,0E,ED,78,FE,DE,4A1
190 DATA 28,04,3E,01,18,02,3E,00,F5,D1,289
200 DATA 3A,4F,80,82,32,4F,80,3E,00,03,2CD
210 DATA 2D,BD,28,02,18,E2,18,02,00,00,228
220 DATA 3E,00,01,00,00,F5,C5,CD,32,BC,3B4
230 DATA C1,F1,3C,CB,67,20,02,18,F2,3A,486
240 DATA 4E,E0,47,4F,3A,4F,80,CD,32,BC,428
250 DATA ED,5F,67,ED,5F,6F,CD,05,BC,CD,5C9
260 DATA 1B,BB,38,03,C3,00,80,CD,FF,BB,4DB

```

```

270 DATA 3E,01,CD,0E,BC,C9,00,00,00,00,29F
280 '
290 '** BASIC ROUTINE TO DRAW PATTERN **
300 '
310 DEG:MODE 0:FOR ik=0 TO 15:INK ik,ik:NEXT:BORDER 0
320 FOR c=1 TO 15
330 rd=c*3+(15-c)
340 FOR z=1 TO (22-c)
350 x=RND*640:y=RND*400:n=RND*36
360 FOR q=n TO 360+n STEP 36
370 PLOT x,y,c:DRAW x+COS(q)*rd,y+SIN(q)*rd,c
380 NEXT q,z,c
390 '
400 '** CALL MACHINE-CODE ROUTINE **
410 '** PRESS ANY KEY TO STOP **
420 '
430 CALL &8000

```

CURVE

Below is a neat one-liner from Jamie Wynn. The routine will ask for a number enabling it to calculate the cross-hatching required for the curve

```

1 'Curve
2 'Jamie Wynn
3 'The Amstrad User Jul 87
10 INK 1,26:MODE 1:INPUT a:MOVE 1,1:DRAW 400,1:DRAW 400,4
00:FOR x=1 TO 400 STEP a:DRAW 400,x:MOVE x,1:NEXT:WHILE I
NKEY#="":WEND:GOTO 10

```

SCROLLING MESSAGE

A short scrolling message routine has been supplied by Mark Bonsher. Alter the text in line 20 to suit your needs - run - and watch your message scuttle across the screen.

```

1 'Scrolling Message
2 'Mark Bonsher
3 'The Amstrad User Jul 87
10 MODE 1
20 a$=" HI, ALL YOU KEYBOARD BASHERS, THIS IS A SC
ROLLING MESSAGE. THE TEXT CAN BE UP TO 255 CHARACTERS LON
G -- MEANING THAT YOU CAN FIT IN QUITE A BIT. ADD IT TO Y
OUR PROGRAMS TO GIVE THEM A MORE PROFESSIONAL LOOK."
30 a$=a$+MID$(a$,1,1):a$=RIGHT$(a$,LEN(a$)-1):LOCATE 10,1
0:PRINT LEFT$(a$,20)::GOTO 30

```

If you have any short routines (less than 25 lines), we'd be happy to look at them and consider publishing. We will also look at anything longer, but it must be on tape or disc. Don't forget to include notes on running your program.

Send them to:

The Editor, The Amstrad User,
1/245 Springvale Road, Glen Waverley, Vic 3150.

Algebraic Expressions in POSTFIX (Reverse Polish) Notation

by Petr Lukes

Users of Hewlett-Packard calculators and FORTH will be familiar with postfix entry of expressions. The "fix" refers to the position of the operator (+, -, *, etc.) in relation to the values it operates on: to sum '1' and '2', we enter the sequence '1','+', '2','=' on an ordinary calculator (infix entry), while the H-P will require '1', 'enter', '+', 'enter', '=' (postfix or RPN entry). In other words, infix expects the operator between the two operands, while postfix requires the two operands followed by the operator.

Adding two numbers is a trivial case, but imagine a complicated expression with several levels of brackets and involving the full range of operators. The human way of solving the expression requires many passes, starting with the innermost level of brackets and ending with the summation of the partial results.

Computers do it more efficiently: they will operate only on the postfix form, which requires only one pass through the expression. Most high-level languages will accept the infix form and convert it into postfix, but FORTH requires the programmer to do the pre-processing.

The BASIC program illustrates the process of conversion. The test expression is one of the roots of the quadratic equation $ax^2 + bx + c = 0$, where 'xx' stands for 'x squared', which in BASIC would have the form $(-b + \text{SQR}(b^2 - 4*a*c)) / (2*a)$. Since taking a square root of a number is equivalent to raising that number to the power of half, the SQR (..) is replaced by (..)^(.5). The program is not intelligent enough to recognize the negation of the first 'b' (a unary or monadic operation, involving only one value as opposed to binary or dyadic operations such as subtraction, which involve two values), so we have to indicate it by '#b'.

The final form is then:

infix : (#b+(b^2-4*a*c)^.5) / (2*a) and will be converted to
postfix: b # b 2 ^ 4 a * c * - h ^ + 2 a * /

Note that the program does not validate the syntax of the expression, so errors such as unpaired brackets, or binary operators following each other (a unary operator following a binary operator is legal), will not be reported. The GIGO (garbage-in, garbage-out) rule applies.

The pseudo-code translation of the conversion process should clarify the rules. The string TEMPSS\$ is used as an auxiliary stack. In computerese, a stack is an area of memory set aside for temporary storage of data. It is a LIFO (last-in first-out) structure, popularly illustrated by comparing it with a cafeteria plate stacker: clean plates are put on top, and the topmost one is always the first to be used. This simile illustrates the principle, but it can lead to confusion later.

Microprocessors implement a stack in hardware, but this stack is usually placed in high memory and grows downwards towards low memory. One instruction is enough to place/retrieve a value on/from the stack (PUSH/POP), and the stack pointer (SP) is automatically adjusted. This stack resembles a column of shelves, with the pointer at the last used shelf. A PUSH will move the pointer down and store a copy of the value in a register on the shelf; a POP will copy the value on the shelf into a register and move the pointer up. The values on the shelves are never removed, only overwritten or copied. But whichever way you look at it, the last value is always on the 'top of stack' and will be the first to come off. Eight-bit processors (e.g. Z80) use a shelf two bytes wide.

This hardware stack is usually the computational stack, because the access to it is optimized; however software stacks can be implemented by defining an area of memory and storing the pointer to it somewhere. TEMPSS\$ is such a stack.

The program stores the expression in postfix form, but in actual processing the conversion and evaluation of the terms would be done simultaneously on the hardware stack. We can use a simpler expression for demonstration, the familiar difference of squares:

infix : x=(5+3)*(5-3) [= 8*2 = 5^2-3^2 = 25-9 = 16]
postfix : x 5 3 + 5 3 - * =

Processing will be done on the computational stack, and follow the rules of conversion, but the evaluation will be done as soon as an operator is encountered, and the partial result stored on the stack:

x 5 3 will be on the stack when '+' appears, indicating summation: '5' and '3' will be popped off, added, and their sum pushed on the stack

x 8 5 3 on the stack when '-' is encountered, '5-3' is evaluated and result pushed

x 8 2 '*': multiply and push result

x 16 = '=' means "store value on top of the stack at the address 'x'"; this will be done and the stack will be clear

The program is as structured as is reasonable, given the limitations of BASIC. The GOTOs, which structuralists find objectionable, could be removed by setting a flag, but it would make it harder to follow the flow of the program. The problem of not being able to call subroutines by name can be eased by naming the subroutine and appending the name to the line number, as in line 410. The interpreter stops processing the line number at the first non-numeric character and resumes processing at the next colon or end-of-line marker after RETURN. This method will work with

GOTO, but not in the construct on ... GOTO/GOSUB 1,2, ...

Pseudo-code for INFIX TO POSTFIX

ENDIF terminates the IF ... ELSE ... construct. Available in most languages; missing in most BASICs, so providing one of the few valid reasons for using GOTOs.

(.) indicates the level of nesting of the conditionals

Initialize

Accept expression in infix form

FOR first character TO last character

Get current character

Search op\$ for current character

IF (1) not in op\$ [must be a value] THEN store on postfix

ELSE (1) [must be an operator]

Get precedence level of current operator

IF (2) level = 0 [closing parenthesis] THEN

WHILE operator on temps is not opening parenthesis

Transfer operator from temps to postfix

WEND

Remove closing parenthesis from temps

ELSE (2)

IF (3) level = 1 [opening parenthesis] THEN

[fall through to ENDIF (3)]

ELSE (3) [must be an arithmetic operator]

WHILE temps not empty AND

precedence of operator on temps is not less than

precedence of current operator

Transfer operator from temps to postfix

WEND

ENDIF (3)

Store current operator on temps

ENDIF (2)

ENDIF (1)

NEXT character

Transfer any remaining operators from temps to postfix

Display expression in postfix form.

```

100 MODE 2:PRINT"Infix to Postfix LKS 861117"
110 DEFINT a-z:WIDTH 255
120 op$="(=&?+-\*/^#" 'operators
130 pr$="012345567789" 'precedence level of each operator
140 xp=2:xp=MAX(1,xp) 'spacing in postfix$
150 zi$="infix  :":zp$="postfix  : "
160 INPUT"Printer (n/Y) ":z$:pr=z$="Y"
170 IF pr THEN PRINT"Printer on"
180 z$="Operators and levels of precedence:":GOSUB 640
190 z$="":FOR a=1 TO LEN(op$):z$=z$+" "+MID$(op$,a,1):NEXT a:GOSUB 640
200 z$="":FOR a=1 TO LEN(pr$):z$=z$+" "+MID$(pr$,a,1):NEXT a:GOSUB 640
210 z$=" = is assignment operator, not equality symbol":GOSUB 640
220 z$=" & represents logical OR AND XOR":GOSUB 640
230 z$=" ? represents relations < = > => <=>":GOSUB 640
240 z$=" \ is integer division, including MOD":GOSUB 640
250 z$=" # represents NEGATE (unary minus) and NOT":GOSUB 640

```

260 postfix\$=SPACE\$(99):temps\$=SPACE\$(99) 'temps\$ is an auxiliary stack

270 ip=1:it=1 'indices for postfix\$ and temps\$

280 PRINT"Enter expression ":INPUT infix\$

290 infix\$="(b+(b^2-4*a*c)^h)/(2*a)" 'test expression; displayable after testing

300 FOR ii=1 TO LEN(infix\$)

310 c\$=MID\$(infix\$,ii,1) 'current character in infix

320 GOSUB 570 Display

330 a=INSTR(op\$,c\$) 'position in op\$

340 IF a=0 THEN MID\$(postfix\$,ip)=c\$:ip=ip+xp:GOTO 430 'not in op\$, must be a value:move it to postfix

350 Lc=VAL(MID\$(pr\$,a,1)) 'precedence level of operator in infix

360 IF Lc=0 THEN WHILE MID\$(temps\$,it,1)<>("":GOSUB 520 T-P:WEND:it=it-1:z\$=CHR\$(7)+" (...)":GOSUB 640 Type:GOTO 430 'closing parenthesis:move bracketed expression from temps to postfix, remove opening parenthesis

370 IF Lc=1 THEN 420 'opening parenthesis:place on temps

380 GOSUB 540 TOS

390 WHILE it>1 AND NOT Lc>Lt 'while stack not empty and precedence of current operator is not greater than precedence of operator on temps

400 GOSUB 520 T-P:z\$=CHR\$(7)+" Precedence break: "+t\$+" => "+c\$:GOSUB 640 'operator from temps to postfix

410 GOSUB 540 TOS:WEND

420 it=it+1:MID\$(temps\$,it)=c\$ 'current operator to temps

430 NEXT ii

440 c\$="":GOSUB 570 Display

450 WHILE it>1:GOSUB 520 T-P:WEND 'move remaining temps to postfix

460 z\$=CHR\$(7):GOSUB 640 Type:z\$="Final "+z\$:GOSUB 640

470 z\$=zi\$+infix\$:GOSUB 640

480 z\$=zp\$+LEFT\$(postfix\$,ip):GOSUB 640

490 PRINT:INPUT a

500 GOTO 170

510 'T-P:operator from temps to postfix

520 MID\$(postfix\$,ip)=MID\$(temps\$,it,1):ip=ip+xp:it=it-1:RETURN

530 'TOS:operator on top of temps and its precedence level

540 t\$=MID\$(temps\$,it,1):a=INSTR(op\$,t\$):IF a>0 THEN Lt=VAL(MID\$(pr\$,a,1))

550 RETURN

560 'Display

570 z\$="Pass"+STR\$(ii):GOSUB 640

580 z\$=zi\$+infix\$:GOSUB 640

590 z\$="current :"+SPACE\$(ii)+c\$:GOSUB 640

600 z\$="temps :"+LEFT\$(temps\$,it):GOSUB 640

610 z\$=zp\$+LEFT\$(postfix\$,ip):GOSUB 640

620 INPUT z\$:RETURN

630 'Type to screen and printer if selected

640 PRINT z\$:IF pr THEN PRINT#8,z\$

650 RETURN

Welcome to IBM Compatibility

A series in which Chris Collins picks out the best for your PC1512

To those of you out there that have just bought an Amstrad PC1512, I would like to welcome you to the wonderful world of IBM compatibility.

Your Amstrad has been supplied with two operating systems. One of them is MS-DOS 3.20, the other is DOS-PLUS and GEM. What we will be learning about is an operating system that is kindly referred to by most PC users as Mess-DOS. More correctly, it is known as MS-DOS. MS-DOS, and it's brother PC-DOS, are disc operating systems for IBM and compatible personal computers.

Unfortunately, I will not be having much to do with GEM, as I believe that it is not really very useful in the real world, except if you wish to program in BASIC2. Put your GEM discs away, and learn to use MS-DOS, like the rest of the world's PC users.

In the next few months, (Editor willing) I hope to be able to present to you some of the best software that is available to you for use with your PC1512. These will include most of the following types of programs:

Word Processing
Database
Spreadsheet
Communications
Computer Aided Drafting
Painting
Typing Tutor
Utilities

and even some Games to round out the list.

Whilst I am showing these to you, I hope also to teach you that your computer can be a very useful tool, and at the same time, a tool that is also fun to play with.

The first software package that I would like to be able to show you is a database program called PC File III. In its latest version (4.000), it would have to be one of the easiest database programs to use, and yet it would also be one of the most powerful databases that I have come across.

PC File III belongs to a group of programs that are collectively referred to as "User Supported Software". This is a program that is still held copyright by the author, but with his wishes you are free to copy it and then give that copy to anyone that you wish.

The idea is that if you then find you are using the program in question, you are requested to forward a nominal fee (usually in the range of \$25 to \$100) to the author to become a registered user of his program. After you have become a registered user, you are usually entitled to a properly printed manual, a cheatsheet, a couple of program updates and with some authors, even telephone support. The only real problem is that to date all major programs of this type have come from the States, so it worries some people to send the money required so far.

PC File comes on only one disc. On this disc are all the necessary parts of the program that are required to make

PC File operate correctly. Also on the disc is an evaluation copy of the documentation.

After we make a copy of the original disc, it is time to see how this program operates. Type PCFILE at the DOS prompt, and we start to get into the program proper. Up comes the first screen. This is a full title screen, which shows you the version number of the software, the author's name and also asks you which drive you wish to use for the databases. After specifying a drive name, you will then be prompted for the directory or path name. Again the screen will clear and you will be presented with a list of databases on the disc. You choose the one that you wish to work with.

If the database that you wish to use is not listed, PC File will ask you, "Do you wish to define the database?". It will then transfer power to another program on the disc while you define the database. There are a couple of limits that you must obey when defining a database. The maximum number of fields relating to one record is 42. The maximum number of records in a database is 32,767.

Field lengths are variable, depending on the total number of fields that you have decided on. If you have defined 21 or less fields, maximum size on any one of those fields can be 65 characters. If more than 22 fields, you are limited to 25 characters per field.

The only exemption to this limit is the field in a record. If you have less than 22 fields in your database, you can define a SUPER field. This can be used to store comments or a description. The maximum size of this field varies depending on the number of fields in your database. It can range from 1665 characters down to 65 characters.

When you have finished defining

your database, you will be returned to PC File, where you will see the opening menu. There are two basic ways that you can use PC File. One is by typing in a three letter command at the prompt, and the other is by using the function keys. The commands that are listed include all the normal functions that are required by a database program, and a few extras that don't readily explain themselves.

By going through the list you will find that the program will keep things to a very understandable level, whilst still not sacrificing any power. The commands include the ability to do any of the following to a record; ADD, MODify, DELeTe, DISPlay, and FINd. The rest of the commands that are available apply to the database as a whole and include the ability to LISt or clone, SORT the index, BINary search on or off, GLObal update or delete, NAME change on fields, UTILities, and a couple of others that are quite useful as well.

Adding a record is simplicity itself. Type ADD or press F1, and PC File will find some blank space to put your record. Enter your data, using the cursor keys to move around, and that's it. PC File also provides a very useful key for you to use whilst adding records. The ' key (apostrophe) can be used as a duplication key, inserting whatever was in that field in the last record, into that field in this record. Saves Typing !!

There are a couple of automatic fields that are available for you to use. These will cause data to be added automatically when you are adding records to your database. These are listed below:

- MO* will insert the month in that field
- DY* will insert the day in that field
- YR* will insert the year in that field
- YYMMDD* will insert the date in

- MM/DD/YY will insert the date in American format
- DD/MM/YY* will insert the date in Australian format
- TIME* will insert the time as HH:MM

Modifying a record is almost as simple. When you type MOD or press F2, you will be asked to supply a key, record number, + (next record), - (last record), or PgUp and PgDn to get a list. Key could be a bit confusing as it only relates to the data in field one. Record number must be preceded by a hash (#). + and - move you either to the next record, or back to the last. PgUp and PgDn give you a screen full of records to choose from. A back-slash (\) will take you to the last record in the database. When you have found the file that you wish to modify, and have finished modifying it, press F10 to have the data accepted. You will then be prompted again if you wish to modify



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another record. If not, simply press ENTER and you will be returned to the main menu.

To delete a record, type DEL at the main menu or simply press F3. You will then receive the same prompt as before (MOD) asking you to nominate a specific record. Once nominated, PC File will get the record and display it for you. You will then be asked to type DELETE and press ENTER. If you are sure that you wish to delete your record, do so. The prompt will again return asking you for another record. As above, if you are finished, simply press ENTER to return to the main menu.

Next on the list is display a record. Type DIS at the main menu or press F4. You will be asked to supply enough information to specify a record. It will be displayed to you, and you will be prompted for the next. If finished, press ENTER to return to the menu.

Finding a record is accessed by typing FIN or by pressing F5, and you will then be presented with the master find screen. It will show all the fields that you have defined, and their sizes. You are offered four different ways that you can search on any field. These are exact, soundex, scan across, and wildcard. Exact explains itself. Soundex finds records that sound the same as what you have typed. Scan across will find what you have typed in any field. For example, typing >MIT would find SMITH, transmit, and mittens. The last type is wildcard. This will find certain characters appearing in only certain positions in a field. After you have found the record you are searching for, you are given a couple of different options. C will find the next record that fits your criteria, M will allow you to modify the record, D will delete the record and S will stop the search.

One of the other advantages of PC File is the fact that you don't have to define key fields when setting up your database. If you don't understand what a key field is, I will explain. Key fields are defined as such so that if you wish to do a search through a database, the search will apply only to the key fields defined. There is no such limit with PC File, as it can search on your total number of fields at any time.

Pressing F6 or typing LIS at the main menu will get you into listing of your

records. You will be shown the list of report formats that have already been defined, and asked to choose one. If you wish to define a new format, choose the blank file, and you will be taken through everything you need to do to define a report format. At the end of all that, you will be asked if you wish to save the format, and what name you wish to give it. The only problem in this section is a very small one. If you don't enter a title for your report, you will be prompted every time you use that format. You will then be asked if you wish to list to printer, screen or disc. P will get you a hardcopy of your data, S will list to your monitor, and D will list to disc. This is used when you wish to clone a database to create a new one.

F7 or SOR will sort the index of the current database. A list of fields will appear, and you will be prompted to provide the sort fields and whether they are ascending or descending. You will be allowed to supply a maximum of 10 fields for the sort sequence. A prompt will come up on the screen asking you which drive to use for a work drive. This is only necessary if the sort cannot be performed entirely in memory. The sort is very fast compared to some databases, sorting approximately 500 records in a minute.

UTI or F8 will get you to the utilities menu. This menu gives you a further 8 options. These include Copying, renaming, deleting, export or import and merging of databases. The ability to import and export databases is very important if you already have a database on another program and don't wish to retype all the information. I did use Paradox to keep all my databases and when I started to do the review of PC File, I thought that it would be a worthwhile exercise to export my software listing from Paradox, import it into PC File and update it. I found a format that both programs recognised, used Paradox to change the listing to that format and put it on a disc. I then booted up PC File, went to the import menu, imported the file and converted it to PC File format. Press F6 and lets see what happens. Lo and behold, my listing was now in PC File, all correct and available for me to use all of PC File's editing capabilities to update.

Pressing F9 or type MEN will get you

into the smart key menu. This is a list of keys, that you define, that will allow you to press two keys and get a whole line of text.

When I went through and updated my software list, I defined ALT-1 to be DELETE for when I was deleting records. Saves so much typing.

Also available as commands are a global update and delete command. Very useful, but if abused, can also be very dangerous.

Something on the disc that I found very useful was a program called PCSETUP. This allows you to set up a whole series of defaults, including screen colours, database path, program drive, database drive, fast answer, snapshot and a few others. After you run PCSETUP, it will write a file PCFILE.PRO to disc. PC File looks for this file when starting up, and executes any commands it finds. These .PRO files can also be setup for any of your databases to use.

I must admit that after using PC File, even for as short a period as I have, I am very impressed with what Jim Button (the author) has managed to cram into his program. PC File is one of the easiest, if not the easiest, database programs that I have ever come across. It is powerful, it is easy to use, it is easy to follow, and whilst using it, you do not feel like a complete novice. This makes it very useful for beginners to computers, but it does not sacrifice any power to do it, which makes it very useful to those of us that are a bit more knowledgeable in the world of computers. This is something that needs to be in all MS-DOS libraries.

Footnote:

For those of you that don't have a copy of PC File III, or any of the programs that I will be telling you about in the next few months, I will be able to supply copies (including postage and handling) on double sided disc for \$10. Send your order and cheque or money order to:

*C.J. Collins
C/-The Amstrad User
Suite 1
245 Springvale Road
Glen Waverley, Vic 3150*

See you next month !!

A Marriage of Convenience

Two packages combine to provide a powerful accounting and integrated system for your PC1512.

Compact Accounts and Ability, the integrated software package, are both pretty well tried and tested and have certainly proved popular choices amongst PC owners. On their own, they stand up well against other packages, but combined, they are a force to be reckoned with.

If you are not familiar with the packages then here's a run down first. At the end of the article I'll tell you how they link to provide a powerful system.

COMPACT ACCOUNTS

As a testimony to the durability and popularity of this package, it has been sold to over 14,000 users. It also won a "RITA" award - equivalent in the information technology world to an "OSCAR" in the film industry.

If you buy the package from North Coast Computers in Taree (NSW), then you are certain to get the 'Australianised' version. This won't necessarily mean that, for example, *all* references to VAT would have disappeared. What happens in this case is that while VAT will get a mention on the screen, when you come to the all important invoice or statement that gets presented to your client, the words VAT have been replaced by Sales Tax. You also get a much more flexible version than the one available in the UK as will become clear further on.

The package that was used for this review came from NCC. They understand the problems associated with purchasing a new package and have gone to the trouble of producing an audio tape which talks you through the various functions of the package using a demonstration company.

Whilst the tape is of great help, it cannot expect to teach you the basics of accounting which you will need when using Compact.

Choice

There are two versions of this package. Compact Accounts provides Sales Invoicing with updates to the Nominal, Sales or Purchase ledgers where necessary, but there is no stock control. On the other hand Compact Accounts Plus gives you everything you find in the lesser package plus Stock Control and Order Processing fully integrated with the Sales Ledger. The type of business you run will determine which one you opt for, but with just \$100 difference between the two I'd be inclined to go for the Plus version anyway. Other modules are available separately, for example, Daybook.

One choice you don't have, unless you enjoy much disc swapping, is a hard disc requirement. I needn't go into the virtues of a resident hard disc - suffice to say that once you have got one you'll never go back. You really need one with this system.

Menu Driven

Either package is entirely menu driven, which helps to make it user friendly and, to some extent, foolproof. Depending upon the module selected, a number of options are presented for selection with "Enter" taking the operator back to the main menu. When into the depths of the module, the function keys play a major part in directing the route the operator wishes to go.

Parameters

Each module of the package is governed by a parameter file which dictates how certain data fields and printed output will be handled. The Sales Ledger module, for example, gives the user the opportunity to enter

the standard name and address of his/her company to be printed on all stationery (invoices etc.); whether automatic account numbering should be invoked on entry of new accounts; whether the Sales Ledger should be run on a brought forward or open item basis - and so on. The Nominal, for example, can be set up to include budgets and comparatives.

Sales Ledger

This can stand alone or be integrated with the Invoicing module. It maintains full details of customers, including turnover figures for the current month and year to date. Credit limits can be set and an alpha search enquiry facility can provide a hard copy of transactions and payments. The system uses standard Rediform pre-printed invoices and statements and is also capable of producing mailing labels.

Automatic audit trails are provided with machine-generated consecutive batch numbering which ensures system security and, of course, there are the usual management reports (aged debtor analysis reports etc.) with selection options.

Purchase Ledger

This module maintains full details of suppliers including the amount of well earned cash you are giving them currently and year-to-date. Like the Sales Ledger, it too can be organised as a brought forward or open item system and provides batch processing of all types. It also takes care of pre-payments. You can print out sales tax reports, all the transactions relating to an account, aged creditors reports (with various selections such as 'no zero balances') and cheques and remittance advices if required.

Nominal Ledger

This is the heart of any accounting

system which provides the final analysis of how well your business is (or isn't) going. The Nominal Ledger module can stand alone or be fully integrated with other ledgers. The system maintains a standard double-entry bookkeeping system and allows full journal posting, including accruals and standing journals. Budgeting also features in this module, so there is also the provision to produce variance reports either currently or year-to-date. A number of trial balance options exist enabling the operator to print with or without year-to-date balances.

Sales Invoicing

Here is where Compact Accounts and Compact Account Plus differ considerably. If you are not interested in Stock Control then the former package will suffice. CA Plus is more sophisticated in that it will provide the stock updating and reporting you would normally expect with an order processing system. So you have a choice - to use the CA Sales invoicing module as a glorified typewriter to pump out your invoices or CA Plus to really get the adrenaline running at stock taking time.

Data Export

Both versions of Compact Accounts have the facility in each module to produce a DIF file. This is a file of specified information which has been extracted from the system you have been working in and can be used as an input file to another application. In its regular form, CA is capable of outputting to Wordstar/NewWord, SuperCalc2, Multiplan or Cracker. If you get the Australian version you can also output files to Ability. This is what makes the package stand head and shoulders above other accounting packages. However, before I discuss the exciting possibilities, we should look at Ability.

ABILITY

When you consider Word Processing, Spreadsheets, Business Graphics, Database and Communications in one package your thoughts may wander to Symphony (Lotus) or Framework (Ashton-Tate). They may well return with a jolt when price-tags of around \$1250 are mentioned. All the more surprising therefore that Ability, with all these facilities plus Presentation

Graphics, comes in at around \$300.

Ability's six applications running under MS-DOS are fully integrated, which means that they work together. You can take information from a database, move it into a spreadsheet, turn the spreadsheet into a graph, include the graph in a document and then transmit the document.

The whole package is menu-driven, sometimes down to three levels and in many respects can save you the bother of remembering the MS-DOS commands as it can copy, rename, delete and organise your files. Other MS-DOS programs outside of the package can also be run without leaving Ability by merely selecting the application through the Library Screen. The package has adequate 'help' facilities through function key 1.

Once a file has been accessed it is stored in memory and an asterisk displayed against its name in the library. As Ability needs at least 348k the number of files loaded into memory is limited, but a reminder of what's left is displayed on the status line at the bottom of the screen. If you do have sufficient memory to load two files (any combination is accepted) you can move quickly between the two selecting or dropping information as you go (Pick Up and Put Down via function keys 5 and 6).

Spreadsheet

Ability's spreadsheet, in terms of presentation, is no different from many others. It is organised in a table format in rows and columns, with the rows numbered sequentially down the left edge of the screen and the rows labelled across the top. It seems that Ability can handle 9999 rows by 702 columns, depending upon the amount of memory available, although I can't think who would want to develop a spreadsheet as large as that.

The 'Pick Up and Put Down' facility works well if you want to move information contained in a cell to another. Columns can be sorted (alphabetically or numerically) into descending or ascending order, blocks of cells can be rotated, formulae can be entered, and the whole thing can be printed sideways if your printer has a graphics mode.

Word Processor

It's called Write, and is very easy to

use. The size of a document is, naturally, limited by the memory availability. I doubt that you'd get more than 40 full pages with the 512k less program overhead that the PC1512 would provide. There again, I didn't fancy typing that lot in, so I could be proved wrong. One drawback - it doesn't have a spell checker.

Write tries hard, and successfully, to imitate the final printed document (an almost WYSIWYG) and is achieved by remaining in graphics mode.

An interesting aspect about the interaction between modules is that if one wishes to place a spreadsheet (or part of) into a Write document, after having gone through the various key depressions to access the spreadsheet, the spreadsheet itself is presented into the WP document - not a copy. This means that any last minute amendments that you need to make to the spreadsheet appearing in the document are amending both the document and the spreadsheet at the same time. All imported information like a spreadsheet or perhaps a graph are automatically centred in the document. Another interesting point is that while it may look as though you have saved the graph on the screen within your document, this is not so. A pointer containing the name of the graph is retained (this saves space rather than having the graph in two places) and so any amendments to the graph are automatically made to your document.

As the document is held in memory, movement is quite fast. To delete a block of text, it is shaded via F7 and then deleted. Movement of a block of text is similar.

Graph

There are four graph formats available; line, pie, bar or stacked bar. Line and Pie we all know, and with the pie it is possible to "explode" selected segment. The bar graph (or chart) is the default if the style is not specified and can consist of a series. For example, the first column could be split into a series of three pieces of information side by side - income in Jan 85, income in Jan 87 and income in Jan 87. The stacked bar chart presents the same information but with one on top of the other, shaded of course, in

(continued on Page 28)

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one larger column.

The information for a graph is normally obtained from a spreadsheet by identifying the relevant cells. In turn, as mentioned above, the graph can be incorporated into a WP document.

Database

As with most databases, the first operation is to create a master to identify the layout of the records in the database. With Ability, this is a simple operation and reasonably foolproof as it is clearly displayed on the screen. Adding or amending a record is equally simple as each record is displayed in the same format as the master originally created. If you delete a record by mistake, it is possible to get it back using the Recover command, as Ability keeps a copy of them - but you will run into trouble if the memory available is getting low.

Access to records can be by number, or alpha-matching, and searches can be made with "=", "<", ">", "AND", "OR" and "NOT". You can also create and save subsets of the main database. This saves having to look at all the records again at a later date. The subsets are treated in the same way as the main database with the exception that you cannot add records.

Sorting, either the main database or a subset, produces a new (sorted) database as well as retaining the old one. A blank copy of the master form is presented for you to enter the field (or fields) by which you want to sort.

Reports normally follow a sort in day to day operation, and here three options are provided.

A Summary Report is used when you want to organise information into columns. You choose which fields to include and specify the order in which they appear. Column headings can be added and totals (and subtotals) can be calculated. You can also preview the report on the screen before printing it.

A Form Report is simply a listing in the same format as the records appear on the screen.

The final option is Mail Merging where, perhaps, you would create a letter with Write and then use the mail merge command to pluck out the names and addresses and print the completed letter.

Of course, you still have the "Pick Up and Put Down" facility, and any

amendments to the main database are automatically reflected in other copies you may have.

Communications

This is effectively a terminal emulation program. That is, Ability acts like a dumb terminal (or a VT100 or VT52) - you specify which. You should be able to connect to Minerva, but not Viatel as their Viewdata graphics are not supported. Naturally a modem is required and a Hayes or a Hayes compatible will suffice and provide auto-dialling.

If you want to buzz some information down the line to another Ability user, the built-in setting in the Port Settings screen has done most of the work for you. Passwords can be exchanged before any data is sent or received. In this mode, any Ability file can be transmitted, including graphs, spreadsheets, databases and so on. The recipient will always receive an exact copy of the file.

To save you the hassle of lengthy log-in procedures or entering frequently used entries a log-in file can be created with Write. This file contains a series of commands that Ability will run automatically.

Presentation

This module, which can be found in the 'Other Program' option, is essentially a slide-show option. During the course of using any Ability application, you can take a snapshot (an exact copy of the screen) which is then stored in a snapshot library from which the Presentation module retrieves the "slides". The library of "slides" can be further enhanced by adding text, symbols and music, the latter incidentally can come from a collection of built-in segways in the program. The order in which the snapshots are shown can also be amended and a playback feature will ensure that you've got it right.

At first glance, this module seems a bit gimmicky and destined to be used by your local computer shop. But there are more serious applications - snappy presentations at the monthly sales meeting, graphic explanations of current trends to a committee or perhaps quite simple a sales demo.

Documentation

A pretty comprehensive and clearly

laid out manual accompanies the package. In addition, a step-by-step tutorial on disc takes you through all the options a gives good practice before launching into a live situation. These, coupled with the help functions, make using the package relatively painless.

COMPACT + ABILITY

Ok, you can buy either package separately, but a logical extension to the Compact package by North Coast Computers in Taree (NSW) has made the combined packages a very powerful piece of software. What they have done is to modify one of the optional extras in the Compact package (Nucleus to be precise) and incorporate it into the main Compact menu. The reason is clear - Nucleus, a data extraction program, is not the easiest of programs to handle, especially for the beginner. By making a new version much more user friendly, and letting Compact reside under Ability, you can extract any information from the accounts system and drop it into whichever application you want in the database system. What's more, Nucleus would only output selected fields whereas the new Compact version can extract all fields.

Both packages in their own right can be recommended, but combined in this way is surely the answer to the most frequent "if only" question.

Where to buy them

Ability (around \$300) is a Migent product from America, imported and distributed to dealers by ISD.

If you need more information, or the name of your local dealer you can ring ISD on the following numbers: (03) 222 2288 or (02) 371 9631.

The modified versions of Compact Accounts (\$399) and Compact Accounts Plus (\$499) are available from North Coast Computers, 22 Albert Lane, Taree, NSW 2430, Phone (065) 526691. You can also get other Compact modules and Ability from NCC. If you are starting from scratch NCC can provide a complete system consisting of Ability, Compact Accounts (or Compact Accounts Plus), a single drive PC1512 with mono monitor and a 20mb hard disc for \$3995, with financing available if you are a bit short this month - so there can be no excuses now!

DB or not DB?

Mike Trembath poses the more common questions and provides the answers

In this article we will address what a database is, what types there are, how to choose one and how to organise it.

It is important to understand what a database is. A database is a group of records which can be examined and if necessary updated. A simple example would be the names and addresses in the telephone book, or those on the Readers Digest computer. They are accessed and everybody's names are transferred into those well known letters. Other databases include your bank account, the subscriber lists for this magazine and, of course, those contained on the police computers.

This leads us to the variation in the types of databases. For instance, an address list is very different to a bank account. Addresses are of a fixed size - once they have been fed in they never change in length, whereas your bank statement needs to be extended as you write more cheques and get more into debt.

Another term used with databases appears at this point. This word, as some of you will know, is relational. This often creates confusion but in reality is a simple concept. Take the example in Figure 1 below:

This is a typical application for a business. The data on a particular customer is split into (in this example)

3 files. Relational means that these files can relate to each other by using some unique key (the customer number) and that more than one file can be used by the database at one time.

So why not keep all the data in one large file? There are several reasons for this. Firstly consider how a record is found. If the files are not indexed (see later) then the only way to find a record is to do a sequential search. This means that all the characters in the file are checked one by one, until a match is found. Now the amount of data you have in the file will govern the average time taken for a successful search. It is unusual for you to require all of the data from a particular record at once (when a lot of data is kept on each record) and therefore a waste of time having to search through it. For example, if in fig. 1 a customer telephoned with an account balance enquiry (as a bank would check your account) you do not want to spend time looking through all your past transactions. The only datafile open would be the account details. This means that the search would be a lot quicker.

This relationality has another plus. It means that you can add more data to an account if you need to. To do this you simply make sure that the record you add has the same key as the old one. So, for example, if one customer had two detail files then you would

simply add a new record to the file with the same customer number. This system allows you to have as much information on each customer as you require. If this confuses you, compare it to a library index where all the details of all the books in a library are kept. You are simply telling the computer, by using a key, which author wrote the book and so each record in the file is linked by the key (ie. the author). So all you have to do if you add a book to the library is put a new card into the file making sure it has the correct author's name (key) on it. This allows the file to be expanded to any size you like.

The fastest type of databases use indexing to get their speed. When looking for a record, the computer looks through the index file until it gets a match. This may be in a 2-Dimensional Array within the database software. When it gets a match, it looks in the pointer cell which holds the address of that record in the computer. The computer can then go straight to the appropriate record and get the data. If you have a field within this record that is also a pointer then this can point to the next piece of data - so you can "chain" as many records together as you require (see Figure 2). In this type of system the computer only has to search through the list of names (index) and it is that which makes it so fast at data retrieval.

So this seems to be the ultimate way to store data. The indexing provides fast access, and the pointers allow you to continually add new records to the system. Is there anything faster? Consider if you had 1000 records. The record you want might have been the 999th one. This would be a quick search because you do not have to search through the data, just the index. There is however, an even quicker way. This requires that the index file be

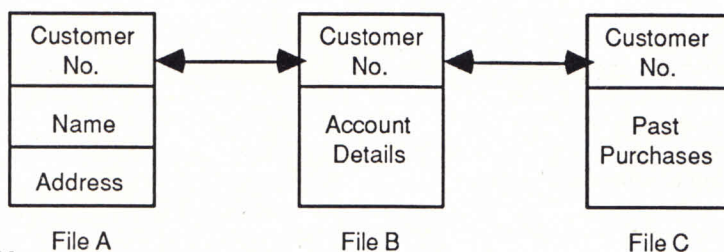


FIGURE 1

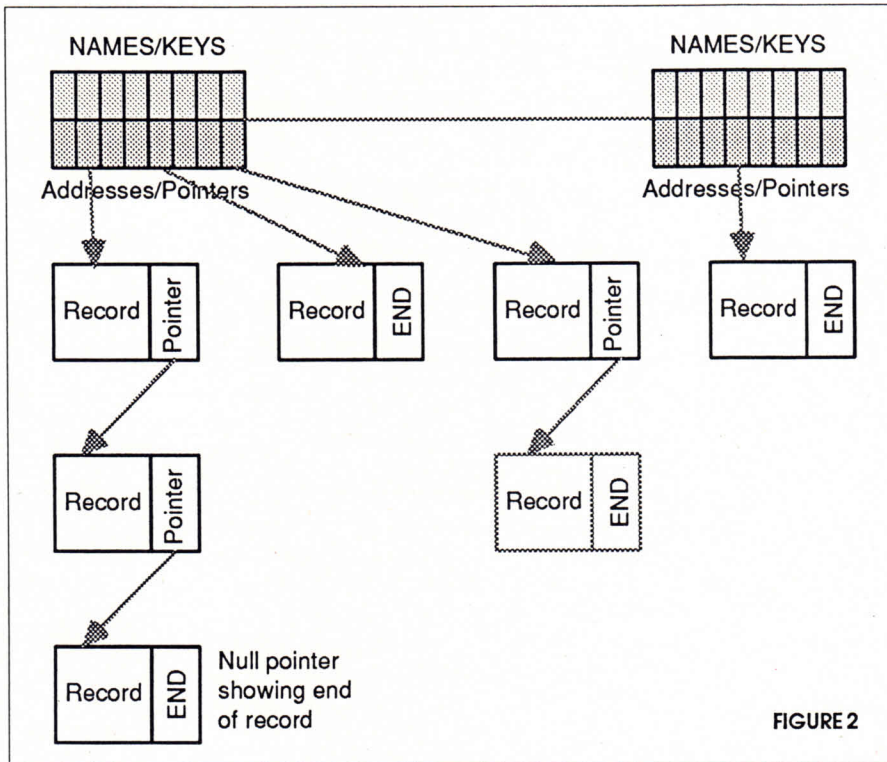


FIGURE 2

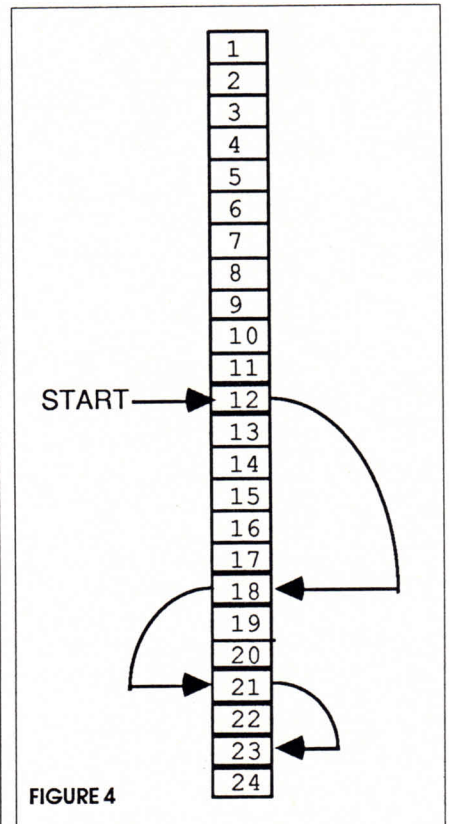


FIGURE 4

instead of one. However, on average you do save a lot of time with this approach.

In selecting a database you must consider 2 things. Firstly, the obvious one, you must know the data you intend to store. Is it for instance an address list which has records of standard length or is it an accounts system which would need a fully relational system.

The second and often overlooked factor is your own computing ability. Fully relational databases (with perhaps the exception of G base) can get pretty complicated, especially if you use all of the features offered (ie having more than one file open at once). So you must carefully consider your requirements and abilities before you start. Don't bite off more than you can chew!

To sum up databases go from the very simple to the very, very complicated and it is important that you select the one that suits your needs accurately. I would suggest that you do not go in for overkill, as it will end up having a negative effect on your system.

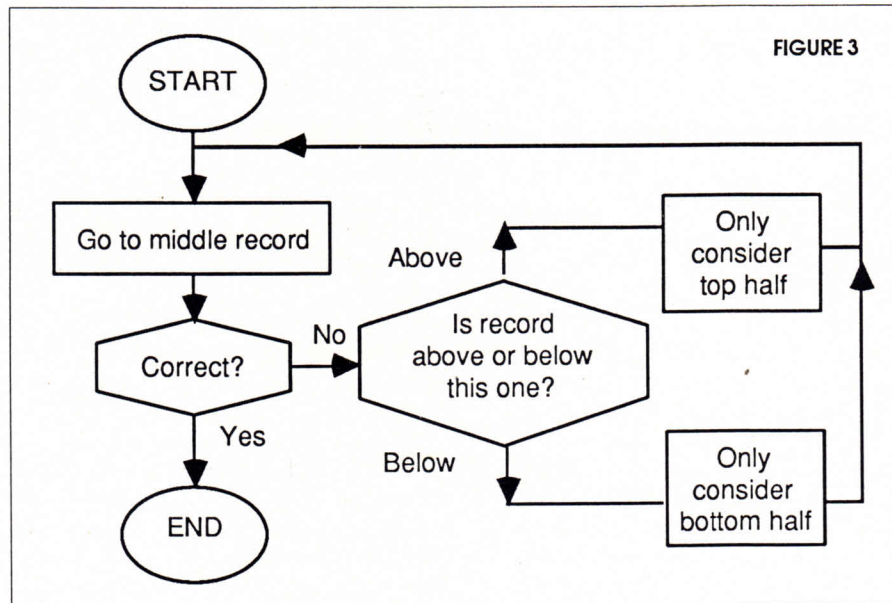


FIGURE 3

sorted into alphanumeric order. Then you use the bisection method of searching. There is a simple algorithm for doing this (shown in Figure 3). It is easier understood with an example as shown in Figure 4 (next column). Here, the object is to "FIND 23".

The search starts by going to the middle record (12) and checking to see if 12=23. The next question asked is 23<12 or is 23>12. This tells the system

to reject the bottom half of the index. The program then goes to the centre of the top half (ie 18) and performs the same checks and ends up in the top quarter of the file. As you can see it only takes 4 searches to reach its target. This can be a staggering saving when you have very large indexes. Note however, you do not always have a shorter search. What if you looked for record 1? It would take 5 searches

Looping the Loop

In part 4 of his BASIC tutorial, John Hughes explains how to go round and round and round in circles.

What computers are particularly good at is repeating the same operation hundreds or even millions, of times. This is particularly handy because mindless repetition of this sort is just the kind of thing which most of we humans find mind-bogglingly boring.

If required to work out the sales tax on the ten-thousandth item in one morning, humans are likely either to start making silly mistakes or to quit completely and have another cup of coffee. The computer, knowing nothing of coffee except as something that gets spilled over it, plods on as accurately as ever, and never gets bored or fed up.

Doing something over and over again is called 'iteration', and computers use iteration for all sorts of operations. A very common way in which they calculate square roots, for example, involves making an educated guess at the right answer, squaring that answer and comparing it to the original number, and then modifying the first guess and repeating the whole process.

Getting the correct answer hardly ever takes more than four or five tries, and you can see how fast it is if you load BASIC and then type in PRINT SQR(50), or any other number you like. Incidentally, you now have a new BASIC keyword: SQR will find the square root of any number which is enclosed in the brackets immediately following.

```

10 REM Program to input numbers and find their
total
20 REM Input is terminated by a zero input
30 REM The Amstrad User
40 CLS$=CHR$(27)+"E"+CHR$(27)+"H"
50 PRINT CLS$
60 RTOT=0
70 PRINT "Input a number please, or zero to
terminate";
80 INPUT NUMBER
90 RTOT=RTOT+NUMBER
100 IF NUMBER<>0 THEN GOTO 70
110 PRINT
120 PRINT
130 PRINT "The total of all the numbers is";
140 PRINT RTOT
150 END

```

The program from Part 3

Looping in BASIC

We have already made up programs which use the IF and GOTO commands to make 'unstructured' loops, and the

running total program which we first met in the third part of this series, which used these commands, is reprinted here. To refresh your memory about this program, it asks you to input a series of numbers and adds them into a running total. When you type in the 'rogue value' zero, the program leaves the loop and prints the running total.

A loop of this sort makes sense when you don't have any idea how many times it is to be repeated - you can get out at any point by just pressing zero. However, Locomotive BASIC does have two more formal loop structures which are a lot easier to follow than the IF-GOTO example, and which should be used in preference to IF-GOTO whenever possible.

The first of these is a WHILE-WEND structure (WEND stands for END of the While loop). A second and more useful structure is really the subject of this article; it is called a FOR-NEXT loop.

I'm only here FOR the NEXT beer

The structure of the FOR-NEXT loop is shown in the box. You can see that it consists of two separate parts, one of which - the FOR part - comes at the beginning of the loop and the other of which - the NEXT part - comes at the end. The FOR line consists of four parts, of which three are compulsory and one optional. Here is an example:

```
FOR LOOP%=1 TO 19 STEP 2
```

The compulsory items are the keyword FOR; the loop counter variable which we have called LOOP%, but which can have any BASIC variable name; the value which the counter variable is given when the loop is entered for the first time; and the value which the counter variable must reach to make it end the loop.

The optional item is STEP, which tells BASIC by how much the counter variable is to be increased every time it goes through the loop. If you leave it out, BASIC assumes you meant STEP 1.

The NEXT line consists of the keyword NEXT and the name of the loop counter variable, eg.

```
NEXT LOOP%
```

A working example

This is rather a lot to take in at one go, so type in Program 1 and RUN it. You should get the result shown. What has happened is that on the first trip through the loop, the counter variable LOOP% is set equal to 1 (by the LOOP%=1 command) so that the value 1 is output by the PRINT statement in Line 20.

When the program reaches NEXT in Line 30, LOOP% is

increased by the value stipulated by STEP, so that on the second trip through the loop the value which is output is 2; this continues until LOOP% is equal to 5, which has been chosen as the ending value for the loop, at which point control of the program 'falls through the bottom' of the loop and the program ends.

Try altering some of the parameters in Line 10 to see what happens when you run the program; you can try different values for both the starting and ending values of the loop as well as for STEP, provided that you choose whole numbers (because LOOP% is an integer variable) and that the starting value is lower than the ending value.

What's wrong with real numbers?

In the last article, we warned that some fractional values can't be held precisely in the computer. To see this, try Program 2. This is just a variation on Program 1 using real numbers instead of integers. The calculation works fine up to a certain point, but then the rounding errors take control.

One odd result of this is that, although 1 is given as the ending value of the loop, it never actually gets printed. The moral of this is that loops which rely on a real number for the loop counter are not to be trusted!

```
10 FOR LOOP=0.1 TO 1 STEP 0.1
20 PRINT LOOP
30 NEXT LOOP
40 END
```

Program 2

10,9,8,7,6,5...

You can use a FOR-NEXT loop to count down as well as up; Program 3 is a simple variation of the first program to show how this is done. The ending value is smaller than the starting value, and the STEP value is a negative one.

```
10 FOR LOOP%=5 TO 1 STEP -1
20 PRINT LOOP%
30 NEXT LOOP%
40 END
```

Program 3

In Program 4, we make sensible use of a FOR-NEXT loop to get away from the awkward IF-GOTO structure of the running total program we started with. This version doesn't just work out the total, but works out the average as well. There are a couple of things to notice about the program. The first is that you can use variables instead of numbers for the start and end values of the loop; it is possible to use a variable for the STEP value as well, but that doesn't happen so often. In this program, we have to ask for the value in Lines 60 and 70 before we can use it to control the loop. Second, we have used the shortest possible form of the FOR-NEXT command; we have done without the keyword STEP, which is unnecessary because the loop is going up in steps of 1 anyway; and we have also left out the name of the loop

counter variable in Line 90 after the keyword NEXT.

```
10 REM New program to input numbers and find
their total and average
20 REM The Amstrad User
30 CLS$:CHR$(27)+"E"+CHR$(27)+"H"
40 PRINT CLS$
50 RTOT=0
60 PRINT "How many numbers?"
70 INPUT CASES%
80 FOR LOOP%=1 TO CASES%
90 PRINT "Type in a number"
100 INPUT NUMBER
110 RTOT=RTOT+NUMBER
120 NEXT LOOP%
130 PRINT "The total of all the numbers is";
140 PRINT RTOT
150 AVERAGE=RTOT/CASES%
160 PRINT "The average is";
170 PRINT AVERAGE
180 END
```

Program 4

More than one loop at a time

If you want, you can put one FOR-NEXT loop inside another. Program 5 is a simple example of this kind of thing, and if you type it in and run it you will see how the two loops are 'nested' one inside the other. This is the best way to see how it works, as it can get confusing otherwise.

```
10 FOR LOOP1%=1 TO 5
20 PRINT LOOP1%
30 FOR LOOP2%=1 TO 5
40 PRINT LOOP2%
50 NEXT LOOP2%
60 NEXT LOOP1%
70 END
```

Program 5

The output from this program will begin as follows:

- 1 (that's LOOP1%, first time round)
- 1 (LOOP2%, first time round)
- 2 (LOOP2%, second time)
- 3 (LOOP2%, third time)
- 4 (LOOP2%, fourth time)
- 5 (LOOP2%, fifth time)
- 2 (back to LOOP1%, second time round)
- 1 (LOOP2% starting over again)and so on.

Each loop is treated as a separate entity, and the inside one is taken back to the beginning every time it is entered. Look at this example very carefully, even experienced programmers can get themselves tied into knots when they are working out where they are in nested loops, as I know only too well.

The only additional rule that you have to follow with nested loops is that they must be fully nested inside each other. Program 6 is illegal, because the NEXT for the inside

loop comes after the NEXT for the outside loop.

```

1  REM This program is illegal!
10 FOR LOOP1%=1 TO 5
20 PRINT LOOP1%
30 FOR LOOP2%=1 TO 5
40 PRINT LOOP2%
50 NEXT LOOP1%
60 NEXT LOOP2%
70 END

```

Program 6

POINTS TO REMEMBER

Some rules about loops

FOR-NEXT loops aren't difficult to use once you see how they work, but there are a couple of points to watch. Never try to modify the counter variable in the middle of a loop. That is, if your counter variable is LOOP%, don't have a line reading LOOP%=LOOP%+1 or similar inside the loop.

Don't ever rely on using the value of a counter variable after you have left the loop, because different versions of BASIC treat it in different ways. This unpredictability makes it a dangerous variable to use.

Although you can leave a FOR-NEXT loop in the middle,

provided that you return later to the point at which you left it, it is much safer not to jump out of a loop in the middle.

If you absolutely have to do one or more of these things in the course of a program, then use IF-GOTO rather than FOR-NEXT loops.

Things that go wrong in loops

Mostly, FOR-NEXT loops don't cause too many problems; this is because they have a clear structure, so that you can see exactly what you are doing much more easily than with the IF-GOTO combination. However, there are a couple of things which can go wrong.

If a loop is only executed once when you believe it ought to be executed several times, check that the starting and ending values are right, and that any value for STEP makes sense too. This is especially important if you are using variables to establish these values, as it is very easy to change the value of a variable without realising it.

If the opposite happens, and the program doesn't come out of a loop at all, check the same points.

An 'Unexplained NEXT' error message almost always means that you have not got your loops properly nested; alternatively, you may have put the wrong name for the counter in the NEXT line.

***NEXT MONTH:** John Hughes digs a little deeper into strings, and the different techniques which Locomotive Basic offers for handling them.*

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TIP-OFFS

Topical tips and handy hints to unleash more power on your PCW

Psst! Wanna know a secret? Then you have come to the right pages. Tailor made for all music taping pirates is this month's tip from Simon Hall - a simple but effective LocoScript document to print out all your cassette inlays for you. If that doesn't tempt you, how about telling the time in BASIC? Colour coding your discs? The list is endless.

Logo secrets

A few hints about the mysterious world of Logo. Using the [f1] key during a graphics routine will cause it to pause. You can then move the turtle and carry out another procedure if you want. Then type GO to return to the original procedure. It will continue from the turtle's new position. Using the [f5] after a graphics routine will return the screen back to the split screen in use before the routine.

If the full graphics screen is in use when you are printing text with graphics you have to use f s at the end of the command:

```
ts setcursor [n m] pr [...
(where n and m are the co-ordinates of the place on the screen where you want the text).
```

What type?

Here is a neat way to ring the changes in typefaces using the escape combination ESCIn (with a 6 bit number n). It uses a DEF FN statement at the beginning

of your program

```
DEF FNfont$(b%,c%,d%,
e%,f%)=CHR$(27)+"!"+
CHR$(f% OR 4*c% OR 8*b%
OR 16*d% OR 32*e%)
```

In this

b% stands for BOLD
c% stands for CONDENSED
d% stands for DOUBLE

(strike)

e% stands for ENLARGED
(double width)

f% stands for FONT
Easy to remember. A zero in the function call turns each parameter off and a one turns each parameter on. The only parameter not obvious is the Font. Here a zero gives Pica (10 pitch) and a one gives Elite (12 pitch). From this you can achieve the full variety of combinations.

```
PRINT FNfont$(0,1,0,0,0);
17 pitch (Condensed Pica)
PRINT FNfont$(0,0,0,0,1);
12 pitch (Normal Elite)
PRINT FNfont$(0,0,0,0,0);
10 pitch (Normal Pica)
PRINT FNfont$(0,1,0,1,0);
17 double pitch (Condensed
Enlarged Pica)
PRINT FNfont$(0,0,0,1,1);
12 double pitch (Enlarged
```

Elite)

```
PRINT FNfont$(0,0,0,1,0);
```

10 double pitch (Enlarged Pica)

There are one or two problems. For instance when using Elite (f%=1), Condensed (c%=1) has no effect. And for some reason using Bolding (b%=1) and Elite (f%=1) does not produce Bold Elite as expected but Enlarged Pica. There seems to be no way to reproduce 15 pitch, but why does anyone want to use it?

R.D. Post

Underlining in NewWord

One annoying drawback with using NewWord is that you cannot reproduce continuous underlining on paper. This can be rectified (as long as your printer can do continuous underlining, as the PCW standard one can) by 'installing' the program.

Copy the program file NW.COM into the memory drive. Put the NewWord disc in the current disc drive and type NWINSTAL. You are now given the option of changing the default settings in the program (see the 'Nuts and Bolts' section of the NewWord Manual. With option H, you can change the default setting from word underlining to continuous underlining, which enables this function to work without having to enter the dot command .ul in every document.

Go to 'Patch Menu 3', select the Continuous Underlining option, and type FF at the cursor position - this stands for 'yes'. Now exit from NWINSTAL, and copy the modified NW.COM back from the M drive onto your NewWord work disc.

Julie Capas

What's in a name?

If you have made up your LocoScript work disc by copying the master disc and deleting all the files you don't want, the groups will still be named 'LETTERS', 'CONT' and so on. You can change these names with the [f5] key, but since you can't put lower case letters or spaces into group names, you can never make them revert to 'group 0' if you would rather have unnamed groups.

The name for a group is stored by LocoScript in the group as a file of zero length called 'groupname.GRP'. LocoScript looks for a file ending .GRP and calls the group after it. What you have to do is to delete this file, and then the group will be called 'group 0', or whatever number it is. Although the .GRP file is not shown on the Disc Manager Screen, it can be erased normally. If the group you are currently in is called 'LETTERS', press the [f6] key, specify the name LETTERS.GRP as the file to delete, and you will have unnamed the group.

Kai Arste

Auto debugging

If you type in BASIC listings printed in magazines, you have undoubtedly discovered the pleasures of poring over the magazine page, painstakingly comparing it to what is on the screen, to work out why your program is doing its

impression of a Dodo. If, in BASIC, once your program is typed in you say AUTO line number then your program is listed one line at a time as you press [RETURN], starting with the line number you specified (or line 10 if you didn't give a number at all). Once you get to a line with a mistake on it, you can use the cursor keys to edit the line, [RETURN] to confirm the edits, and [STOP] to leave the AUTO mode.

Ian R. McDougall

Cad and a Bouncer

If you have the game Bouncer by Gremlin Graphics, you may have noticed that on the introduction screen, there is

a hint of a 'cheat mode' available. At the introduction screen, do not press space to start the game, but instead press all the following keys at the same time: Q,W,E,R,T,Y,A,S,D,F,G,H,Z,X,C,V,B,N. It is easier to place a matchbox or discbox on the middle-left side of the keyboard and push down - be careful not to press the space bar. The game will now start and you will never lose your balls when you really should. This means you can get much further in the game and explore the higher levels. If you thought the beginning graphics were good then look at the later-level ones!

Y. Unterman

Coded discs

The trouble with discs is that they all look much the same. But there is a quick means of identification - colour code the spines with marker pens. Master discs can be coded yellow, security copies orange, and day copies left uncoloured. You can be much more sophisticated with your colour schemes if the circumstances warrant; day copies of account/database/spreadsheet program and data discs can all have several colours, as long as you can find enough colours to go round!

G.M. Edwards

Telling the time

The PCW has a clock built

into it which gives the time to the nearest second. This can be set and read from within BASIC, allowing you to write programs timing things. The clock is held in three bytes of memory; the hours in 64502, minutes in 64503 and seconds in 64504. Using the PEEK and POKE commands you can then read and set the time. The numbers in these memory cells need decoding to give the true hours, minutes and seconds. For example, to find out the number of seconds you are into the minute:

```
x=PEEK(64504)
SECONDS=x-INT(x/16)*6
```

The same formula works for the hours and minutes figures too, with 65404

DIY Cassette inlays

Here is a LocoScript document to print cassette inlay cards, complete with titles, and a full list of contents. It also takes care of dotted 'Cut Here' lines. Set up a special group for your tape inlays, called TAPEINS or something. Set up a TEMPLATE.STD in that group, and enter the following information:

Pitch: 17)
Left Margin: 0)

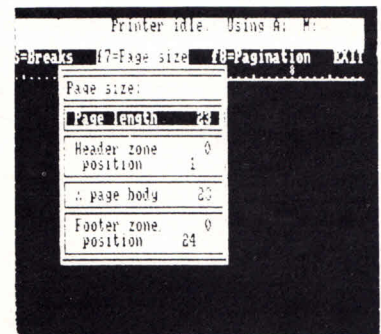
Tabs: 5) set in Layout 35) Menu 39)
Right Margin: 69)
Page Length: 23)
Header Zone 0)
Header Pos: 1) set in Page
Size Footer Zn: 0) Menu
Footer Position: 24)

On the main editing screen:

Line 1: 69 minus signs (one full line)
Line 5: 69 minus signs
Line 6: +Pitch17D+Bold+

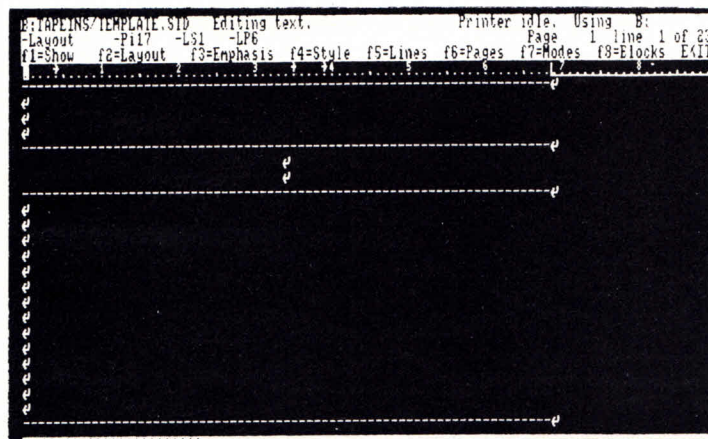
Line 7: Italic+Centre
+Centre
Line 8: -Pitch-Bold-Italic,
69 minus signs
Line 23: 69 minus signs

All the other lines are normal [RETURN]s. When entering the data, use the [f1] menu to show just the 'effectors' on the screen, and use [EOL] instead of [RETURN] to move from one line to the next.



▲ F7 for page details

▼ A sample of the printout



▲ The LocoScript template for inputting cassette inlays

BIG COUNTRY-"The Seer"
TALK TALK-"The Colour Of Spring"

- | | |
|------------------------|----------------------------------|
| BIG COUNTRY-"The Seer" | TALK TALK-"The Colour Of Spring" |
| 1, "Look Away" | 1, "Happiness Is Easy" |
| 2, "The Seer" | 2, "I Don't Believe In You" |
| 3, "The Teacher" | 3, "Life's What You Make It" |
| 4, "I Walk The Hill" | 4, "April 5 th " |
| 5, "Eiledon" | 5, "Living In Another World" |
| 6, "One Great Thing" | 6, "Give It Up" |
| 7, "Hold The Heart" | 7, "Chameleon Day" |
| 8, "Remembrance Day" | 8, "Time It's Time" |
| 9, "The Red Fox" | |
| 10, "The Sailor" | |

LocoScript Diary/Calculator

If you are a LocoScript user, you may envy the CP/M lot their Companions and Write Hand Men. These are utility programs which let you, at the touch of a button, jot down notes, call up a calculator, or browse through an address book, no matter what program you are running. LocoScript, not running from CP/M, can't work with these programs. Instead, here are a few suggestions for your very own 'Stationmaster' (get it? LocoScript? Station-master? Oh, forget it).

Diary/ Memo Pad: Set up your diary as an ordinary file in any group of your start-of-day disc. Laid out in preset sections, in any format you find suitable, this serves as a daily updatable memo list with separate sections for urgent phone calls, meeting times and miscellaneous notes like - Feed the piranha.

Call this diary file TEMPLATE.STD -obviously it can't be in the same group as another TEMPLATE.STD. When LocoScript starts up, it automatically copies all the TEMPLATE.STDs it can find into their corresponding groups on the M drive. This means that you can change disc after disc and your diary will always be available in the M drive for you to update and inspect (as long as you can remember its group number).

Address book/Phone list: This comprises two discs, offering a maximum of over 200 files (more discs needed if you are a very popular person), each file holding a pre-entered address on page 1, followed by a telephone number on page 2.

If you name each file with the contact person's surname then LocoScript will list out all the contacts in alphabetical order on the screen. It is the work of moments to insert it into a letter, or print out the address on an envelope or label - only make sure the template is correctly set up for the envelope, and that you abandon printing before page 2 (the phone number) is printed.

Scratchpad: A particularly neat one, this. LocoScript has an 'Inspect document' command, which with a little cunning can be used as a mini-jotter. LocoScript-using readers will know that 'Inspect' is like one of those tags you tie on your suitcase. It consists of a few lines of text that you can set up and edit to provide a brief description of any file, for random inspection and memory jogging from the disc manager screen. If the name of the file and your memory is good enough to tell you what a file contains, then this identity text is ready and waiting for more interesting purposes. Imagine you are in the middle of a long editing session and the phone rings. Damn! You can't reach that biro (or you've given them up as bad for your health). You badly need to jot down that urgent message, what do you do? Press 'f7Modes' - 'Edit Identify Text' - [ENTER], and there's your three lines of available jotter space. When you've finished, press [ENTER] again. At the end of the day, when you've exited normally from your file, your jotting has been automatically retained for inspection from the disc manager with the [f2]key. You can get a hard copy with [EXTRA]+[PTR].

Steve Gough

Telling the Time (cont)

changed to 64502 or 64503 respectively.

You can zero the clock by POKEing all three locations with zero. Alternatively you can apply a little maths and invert the above formula to work out what values you need to POKE into the memory to set up the time you want.

CP/M's DATE command will set up the day and time for you, outside BASIC.

Drawing the line

A very useful phrase to have in your PHRASES.STD file is +UL+Rjust-UL

Calling it phrase L is appropriate.

It is particularly valuable if you often type anything which needs written responses: questionnaires, forms, pupil worksheets etc.

A small poll has revealed that many people prefer to write answers on continuous lines rather than dotted lines.

The effect of the code is two-fold; used at the start of a new line it draws a neat and continuous line across the full width of the layout. This can be used to divide sections of reports, to make a neat letter heading, or to rule the lines for answers to be written on.

But the cleverest part is that if [PASTE]L is used at the end of a line which already includes some text, the line will simply be drawn to the right hand edge of the layout.

Sorting it out

Owners of Amor's Prospell spelling checker program have a handy way of sorting

lists of words into alphabetical order. Prospell has an option in its Dictionary Utilities submenu 'Build Dictionary'. This takes a file of words, compares them to the current dictionary, and writes the unrecognised words out to disc. The words are output in sorted order. You will need to have a new dictionary disc with no words at all in it (so that all the words in your file are flagged as unrecognised). To do this, choose the 'Initialise Dictionary' option on the Dictionary Utilities submenu, and put in a spare side of a disc into the A drive. Now when you choose 'Build Dictionary', you will be asked whether you want to build to a dictionary or a file - choose 'File'. With your new blank dictionary in the A drive, and

your file of words to be sorted in B or M, answer the prompts for input and output file names. The input file can be a straight LocoScript file, but the output will always be an ASCII file. To read an ASCII file back into LocoScript, use the [f7] Insert Text command while editing. You will find that the output file contains all the words in the input file in sorted order, although they will be all in capital letters.

David Fisk

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AnsibleIndex, Locomail and Write Hand Man reviewed

ANSIBLEINDEX - Amsnet - \$170

Anybody who has tried and failed to read a bad manual knows how important a good index is - be it for a computer program or a town tourist guide. *AnsibleIndex* is a program which will read a LocoScript document and automatically produce a complete, paginated index for it, so now there's no excuse for any more impenetrable tomes.

Preparing for action

The manual is quite short but very well written - it covers all the facts in a very light, readable style that assumes no computer knowledge. But it does seem strange that a manual about an automatic indexing program does not itself have an index, although it is short enough that this isn't a real problem.

The indexing process starts while you are typing your document into LocoScript. Once you've decided that a part of the text is pretty much finalised, you go through it marking all the words and phrases that you want to appear in the index. Then, when the whole document is complete and page numbering won't change any more, you run the index program to pick up all the marked items with their page numbers.

Marking words is done within LocoScript as you type, by using its standard Reverse Video control code. This code is either picked from the *Emphasis* menu, [f3], or more quickly by typing [+]RV. It has absolutely no effect on the printing of a document, but conveniently shows all the words to be index highlighted on the screen when you edit.

Index fingered

AnsibleIndex runs from CP/M and comes on a pre-prepared startup disc, so that when you've finished editing

your document in LocoScript you just press [SHIFT]+[EXTRA]+[EXIT] and it automatically starts. Operation is very simple; you just put your LocoScript disc back in and enter the name of the document, regardless of what group it was in.

Ansibleindex then reads the document and produces a basic index file. Afterwards, you have the option to fine tune the index format, like specifying in which column the page numbers printed alongside your index entries are to start.

This leaves you with a new file in the first group of your LocoScript disc, containing the index. Although it is not a proper LocoScript document, converting it into that form is not too hard, and the manual explains fairly well how to do it. Once done, you can polish it up - delete unwanted entries, add special ones, and so on.

The finer points

AnsibleIndex checks whether a word you index has been done before or not, and if so merges the entries. Multiple occurrences on the same page are only recorded once. For example, if "Glen Waverley" was marked several times on page 5, and again on pages 8,9,10 and 12, the index entry would be: Glen Waverley 5,8-10,12

Phrases can be "inverted", meaning that a phrase in the text like "Chicken with Mushroom Curry" can appear indexed as "Curry, Chicken with Mushroom", or even "Mushroom Curry, Chicken with".

If you are writing a long document with LocoScript you will probably be working with each chapter split into a separate file for speed. AnsibleIndex can go through a series of files one after the other, and then produces a single index for the whole lot.

When submitting a manuscript for

publication, knowing the LocoScript page numbers for the index is about as much use as a Melbourne tram pass in Sydney. Instead, you can produce a dummy index with the actual page numbers left blank. When your proofs come back from the publisher, you can adjust your document and run AnsibleIndex again to get the proper page numbers out.

On the negative side, the main drawback is that you can't index words that don't occur in the text. For example, if a number of pages talk generally about the Stone Age, but that actual phrase never appears as such (even in a heading), then you can't index it. You can however add it manually to the index after AnsibleIndex has done its work.

Also, it would be nice when marking inverted phrases to be able to index them under both forms at once, e.g. "different printers" and "printers, different", rather than *either* normal *or* inverted.

PLUSES • MINUSES

- + Indexes ordinary LocoScript documents
- + Can invert index phrases - "Fred Smith" as "Smith, Fred"
- + Can produce a single index for several documents or chapters
- + Readable and comprehensive manual
- + Can produce a "dummy index" if the page numbers aren't finalised
- + Word counter and word usage analyser also in the price
- The basic index file output is not a LocoScript document
- You can't automatically index general topics (e.g. "software") unless they specifically occur in the text.
- The price will deter casual users.



LOCOMAIL - \$ (shop around!)

LocoMail has one major difference to all its rivals which will give it a big advantage for most people - it runs as a single keystroke command from the main menu of LocoScript. The delivery disc is in effect a new version of LocoScript which extends its commands (and maybe even fixes a few bugs?).

This means firstly that it is simple to use - you don't have to boot CP/M up - and secondly that all the LocoScript features like layouts, justified text and text styles can be freely used in letters to go through mailmerging.

All the input that LocoMail needs, ie. the form letter and the list of data for insertion, are simple LocoScript documents. The mailmerge process itself takes place through LocoScript so you see your letter being composed on the screen in front of you as it is processed, which allows you to stop the run if you see it going wrong. And, of course, the letter is automatically reformatted to adjust to the length of the data items you insert.

LocoMail's mailmerge can run in two modes - "form fill" and full merge mode. Form filling is particularly well suited for very small mailmerge runs where it's just not worth the hassle of setting up a separate data file to do a few letters. In this mode, rather than reading its data from the mail file, LocoMail opens the merge letter like a normal LocoScript document, takes the cursor to each field to be filled in turn and waits for you to type the data at the keyboard. Once all the fields are filled, you have the option of printing or pausing to make further customised edits in LocoScript first,

For full mailmerge runs, the data is stored in a normal LocoScript document which can be easily edited. For the print run, you can either run off all the letters at once or, as with the form fill mode, pause inside LocoScript after each letter to allow you to make further special edits before printing.

Beyond these basic operations, there are a host of more complex features you can use. Apart from composing letters, you can do things like customise terms in a contract to customers needs, leaving out irrelevant ones, and automatically number the clauses consistently no

matter which ones are present.

This is done with "conditional print" statements, allowing you to include or exclude text of any length depending on conditions you specify. For example, you could have a sentence saying "Why don't you drop into our showroom in Elizabeth Street next time you are there?" which would only be printed if the postal area is in Melbourne. Also, you can use simple arithmetic (with +, -, * and /) to number things - it's almost a whole programming language even with a form of REPEAT... UNTIL loop!

But if that all sounds too complex, don't worry. Mail Merge comes with a large and well laid out manual. The advanced features are well split away from the early stages, so if you don't need them they won't bother you. The delivery disc comes with a set of example files that illustrate the program's facilities very fully. The early parts are very well explained, but less so the more advanced ones.

There are a few negative points to LocoMail that will irritate. Locomotive have once more succeeded in choosing bizarrely complex keys to use for the commands. !, £, ;, < and > abound, rather than meaningful codes inserted with the [+] menu - it looks as though the [+] key system could not be extended enough to cope.

Second, to select a subset of a mailshot list you have to insert nasty conditional print commands inside the form letter, which requires unnecessary effort for simple uses. It would be better to have some kind of pre-selection command mode. Also, there is no way to sort the data file to get the letters to come out in order.

But overall, LocoMail is a comprehensive and excellent mailmerger for LocoScript users - without doubt the best of the batch. The only reasons for not buying it are (a) you can't afford the inflationary price, (b) you want to use non-LoCoScript word processors, or (c) you want to use your mailmerger as a database.

The LocoScript Factor

Most mailmergers run as programs from CP/M, whereas LocoScript does not. This means that (with the exception of LocoMail) you are bound to have to create documents in

LocoScript, then reset the machine and start up the mailmerger under CP/M. If anything goes wrong, you have to restart LocoScript and do it all again, which gets pretty annoying.

More seriously, due to some apparently arcane programming practices employed by Locomotive when writing LocoScript, most independent houses have not been able to directly access LocoScript documents effectively. This means that for mailmerging with the Micro Power and Minerva packages you have to export your documents by using the "Make ASCII file" option of LocoScript, which means you lose all your printer commands like boldening and underlining. (Datafile One however is an exception here - it's able to use documents saved under normal LocoScript format).

These are fairly serious disadvantages for dedicated LocoScript users who don't fancy buying LocoMail - but it's not all bad news. The fact that a mailmerger runs under CP/M means that it can also process letter templates from word processors other than LocoScript. Also, many CP/M mailmergers double up as databases, since they have to have many of those facilities anyway.

Yes, but what does a mailmerger do?

The most typical use for a mailmerger is addressing batches of letters for mailshots while adding in a few personal details in the text. As an example, here's how LocoMail approaches the process, showing each stage from thinking to posting:

The Very Big Company Glen Waverley Victoria
<u>J. Shaw</u> <u>1 Gandalf Avenue</u> <u>Hobbiton</u>
22nd June 1987
Dear <u>Mr. Shaw</u>
We find your account with us is still overdue. Please send a cheque for <u>\$250.00</u> by return, or we will send the boys round.
Yours sincerely

1. Write down a sample of what you want the letter to say, marking the bits that will change in versions sent to other people (these are underlined in the sample on the previous page).

```

initials:  J.
name:     Shaw
address:  1 Gandalf Avenue
          Hobbiton
title:    Mr.
sum:     250.00
    
```

2. Think of a short single-word name for each of the items that you marked in the sample - for example, "initials", "name", etc.

3. Type your letter into LocoScript putting the short names where you want the relevant personal detail to appear, in the way that the LocoMail manual explains. Suppose you call this document CASHLET.

4. Now for the actual name and address information, create a LocoScript document called, say, ADDFILE, and type in a dummy set of the information using the short names for each item. This tells LocoMail how the information is laid out.

5. Add in the rest of the data, one per page.

6. At the main Disc Management menu, type M to run the full mailmerger; choose CASHLET as the document name, ADDFILE as the merge data, and select the Automatic option.

7. Do the paper feeding as required, collect the letters, post them and wait for the money to come in!

FEATURES TO LOOK FOR

Whether you are looking for a simple mailshot addressing program or a sophisticated report generator, there are several basic features you ought to check out.

Firstly, consider how you actually get your names, addresses and other data onto your PCW. Most packages use a database to hold the data, which then links to a mailmerge output stage - if

you have never used a database before, then you might find this more work than you thought.

Secondly, even if you are doing very small print runs you will find it useful to be able to abort the merging and restart. This is important if, for example, the paper gets jammed and you have to reprint a letter.

As for the letters themselves, if you use a lot of fancy print controls (bold, underlining and pitch changes), make sure your mailmerger can process these.

Once you progress beyond mailshot addressing, the first thing you will need is automatic text justification. Consider the traditional Reader's Digest letter:

```

Mr. C. Guevara
17 Flushing Meadow
Moonee Ponds

Dear Mr Guevara,
Congratulations! You have been
chosen from all the people in
Flushing Meadow, Moonee
Ponds to receive our special
offer. Yes, the Guevara family
could soon be the proud owner
of "The Condensed Communist
Manifesto", with a handy pull-
out guide to international
arms dealers...
    
```

Many mailmergers reserve a fixed space to insert fields into, but everybody has a different length address, resulting in trailing blanks after all but the longest address lines. This doesn't matter in the actual addressee section, but in the main text of the letter it looks silly. Therefore the mailmerger should lop off any trailing blanks, insert the item in the text and then (this is the difficult bit) rejig the rest of the paragraph to close up the gap without leaving any short lines.

Another useful feature is to be able to do arithmetic in letters. This may sound unlikely, but you often want to insert something like:

```

"after [number] years, your no-
claims-discount will be
[discount]%, so you only pay
$(premium x (100-discount)/100)"
    
```

Also, if you have a large list of addresses to circulate, you won't always want to print all of them, so it is

useful to have a way of selecting which ones to use in a run. This is known as Conditional printing.

Finally, if you are doing large print runs you might want to have the facility to print the output letters presorted by postcode so as to take advantage of special Post Office discounts. In fact, these last three features are often done as preliminary operations in the database, before the mailmerge proper.

Write Hand Man (or should that be Write Hand Person?)

In a version specially for PCW machines, the aim of this package is to provide you with an electronic notepad on your screen that can be called up at any point, no matter what program you are running at the time.

Press the command key, and up in the top left corner of the screen, about 10 rows by 20 columns, you can type brief notes, use a calculator, do some simple edits to text files, see a calendar, define the f-keys or give CP/M commands. Unfortunately, the smallness of the work area is a real obstacle, and makes the file editor virtually useless.

The manual is particularly bad. First, it tells you the wrong command for starting up the package - it should be [ALT]+[, not [ALT]+. Most of the manual is taken up with explaining how to configure the program for other machines, and how to write your own machine code additions.

If you're the kind of person who would spend an hour looking for your ACME shoelace-tie instead of doing it by hand, you'll love Write Hand Man. Frankly, even though the calculator feature is quite useful, anybody who uses the notepad or diary rather than a pencil and paper has just gotta be some kinda deviant. Good background utilities can be extremely useful, but when you have to load 20 files and read a bad manual to do it, that's a another matter.

The Secret Life of SuperCalc

Attention SuperCalc owners! Discover how your spreadsheet can sort out LocoScript files and type in the first ever SuperCalc listing.

SuperCalc2 is the biggest selling spreadsheet on the PCW machines. Although it is simple to get into, it is also capable of some powerful medicine when the need arises - too many people go through life using only its simplest functions.

How often have you had a list of names and addresses that you want to sort into alphabetical order? If you have a database, then fine, but otherwise SuperCalc can help. All you need to be able to do is produce and read ASCII files of the names in question, a task that even LocoScript can do.

SuperCalc to LocoScript

Suppose you have the names and addresses on paper, and you are typing them into the computer for the first time. Start SuperCalc going, and alter the width of column A to be 80 characters (or at least as wide as the longest line you want to type). Use the /F command for this.

Now type in the names in any order you like into column A. Precede every entry by a double quote, to tell SuperCalc that it is text rather than a command.

Eventually, these names will be sorted into order by the first letter of each one, so put the surname first if you are sorting by surname.

For example, to enter Karl Marx's personal details, put the cursor in the next available cell of column A and type "Marx, Karl, Highgate Cemetery

Once you've got all your names in there, put the cursor anywhere in column A and type /A. This is the 'Arrange' command which does the sorting. Type C to sort by column, and press [RETURN] to indicate it is the current column. Abracadabra, it is suddenly in the right order.

To get the data out of SuperCalc, first turn off the row and column borders with the command /G,B then use the output command, /O. It goes through a long list of options with you: choose D for Display format, A for the range of cells to output, D for Disk file output, and finally pick a filename to hold the result.

You can now leave SuperCalc, although you'd better save the file as a normal file with the /S command in case you want to add to it later on, to save you retyping it all. The file you created with the /O command is a straightforward

```
B:group0/LIST.LOC      Editing text.
-Layout      -Pi12    -LS1    -LP6
f1=Show      f2=Layout  f3=Emphasis f4=Style f5=Lines
"Fothering-Thomas, Col. G"
"Bloggs, Fred"
"Zapalowski, Len"
"Sparks, Edmund Peter"
"Bloggs, Albert"
"Moir, Michael Q"
"Aardvark, Aaron"
```

▲ How a set of names should look in LocoScript

```
1:Fothering-Thomas, Col. G
2:Bloggs, Fred
3:Zapalowski, Len
4:Sparks, Edmund Peter
5:Bloggs, Albert
6:Moir, Michael Q
7:Aardvark, Aaron
```

An unsorted column of SuperCalc ...

... and the same after the Arrange command

```
1:Aardvark, Aaron
2:Bloggs, Albert
3:Bloggs, Fred
4:Fothering-Thomas, Col. G
5:Moir, Michael Q
6:Sparks, Edmund Peter
7:Zapalowski, Len
```

ASCII file of the data, sorted as it was on the screen.

You can start up your word processor, include this file in your document and carry on processing it. In LocoScript, this means using the [f7] key and the 'Insert Text' option while editing the file you want to insert the names into.

LocoScript to SuperCalc

To use SuperCalc to sort a list of names already held in a LocoScript document is a little trickier.

The first thing to do is to make sure that the names to be sorted are in a LocoScript document all of their own. Don't have any text you don't want to be sorted on that file. Arrange the names, or whatever the data are, one per line with a [RETURN] ending each one. Make sure none of your data has double quote marks in it - if it does, use the [EXCH] function to replace them with single quote marks instead.

Go through the whole file putting a double quote mark at

the beginning and the end of each line. A cunning way to do this is to use the [EXCH] function again to replace all occurrences of [RETURN] by "[RETURN]", then manually adding one at the start of the first line and removing the extra one after the last line.

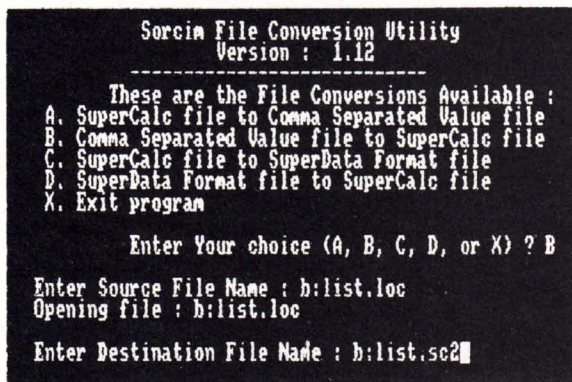
Finish editing the file, and make an ASCII file of it in group O of a CP/M disc. Start up CP/M.

SDI - don't tell the Russians

On side 2 of your SuperCalc master disc is a program called SDI. Contrary to what President Reagan thinks, SDI stands not for 'Strategic Defense Initiative' but for 'SuperCalc Data Interchanger'. SDI is the program that does the job of converting ASCII files into a form that SuperCalc can understand.

From the copy of SDI on your working SuperCalc disc (you did copy it, didn't you?), run it by typing SDI. You now see a menu offering you various choices - the one you want is B, "Comma separated file to SuperCalc format". In case you are wondering, all the double quotes you put in the names list in LocoScript were to make the file a 'comma separated' file for SDI's benefit.

Put in the disc with the ASCII file you created, and type its name as SDI asks you. Think of a name for the resulting file - probably 'something.SC2' is a good choice.



▲ The PCW screen as SDI runs

After a short pause, SDI finishes. You can now run up SuperCalc and load (with /L) the .SC2 file you just created. Now go on as described in the first section - make sure column A is set wide enough, use the Arrange command to sort the data, output it to a disc file and finally read it back into LocoScript. After all this, you have now gone from an unsorted LocoScript file to a sorted one. What more could you want?

A SUPERCALC TYPE-IN UTILITY!!!

This utility is a fairly simple personal finance checker, and has nothing at all to do with the previous section on sorting data and shifting it to and from ASCII files.

The listing has been produced directly from SuperCalc, using the /O command and the 'Contents' option. As you can see, every line of the listing starts with a SuperCalc cell number (eg. A2), then has a blank or some hieroglyphics and an equal sign, and finally has some text or a number.

The SuperCalc Listing

```

A2      = "CASHFLOW: 1/4/87 - 30/4/87
C4      = "      Cheque A/C
E4      = "      Credit Card A/C
G4      = "      Bldg Soc A/C
C5 $TR  = "START:
D5 $TR  = 134.56
E5 $TR  = "START:
F5 $TR  = 145.17
G5 $TR  = "START:
H5 $TR  = 1043.56
A6      = "DATE
B6      = "DESCRIPTION
C6 $TR  = "IN
D6 $TR  = "OUT
E6 $TR  = "IN
F6 $TR  = "OUT
G6 $TR  = "IN
H6 $TR  = "OUT
C7      = '-
C9      = '-
B10     = "TOTALS
C10 $TR = SUM(C8:C9)
D10 $TR = SUM(D8:D9)
E10 $TR = SUM(E8:E9)
F10 $TR = SUM(F8:F9)
G10 $TR = SUM(G8:G9)
H10 $TR = SUM(H8:H9)
C11     = '-
C12 $TR = "END:
D12 $TR = D5+C10-D10
E12 $TR = "END:
F12 $TR = F5+F10-E10
G12 $TR = "END:
H12 $TR = H5+G10-H10
B14     = "TOTAL PROFIT FOR MONTH
D14 $TR = C10+G10-D10-H10
    
```

To type in this listing, start SuperCalc running normally. Set the width of column B to be 20, but leave all other columns unchanged. For each line of the listing, use the cursor keys to get to the cell given in the line, and then type in exactly the text following the equals sign. If it starts with a single or double quote mark, make sure to type that correctly.

The '\$TR' between the cell number and the equal sign on some lines tells you the format that was used to display the entry. After you have typed in all the cell contents, go over the spreadsheet and alter the formats so that all the columns line up nicely. To do this, use the /F command to set the format of a cell to \$TR if appropriate, otherwise leave the format alone.

When you have got all the formats right, don't forget to save the spreadsheet to disc with the /S command. Call the file something like CASHPLAN.TEM - TEM for 'template'.

Free communications software

Rummaging further through the lost treasures of the PCW master discs, Ben Taylor finds some free communications software.

The master discs that come with the PCW have a veritable hoard of free goodies stored on them to please CP/M users. This month, the spotlight falls on side 1 of the discs.

Hold on! Isn't side 1 the LocoScript disc? True enough, but in proper Amstrad style there is a useful CP/M file hidden in amongst the LocoScript files. This file is called MAIL232.COM, and is a program to send information to, or receive from, the big world outside the PCW.

In short, MAIL232 is a piece of comms software which can control a modem and so give you access to other computers with similar setups.

If you are going to use comms services often, you may tire of MAIL232 after a while. It lacks polish and friendliness, and it can't be used to access Viatel. However, for occasional users of 'electronic mail' systems, it is quite good enough, and saves you spending \$100 on special software until you really need it.

It's free, except...

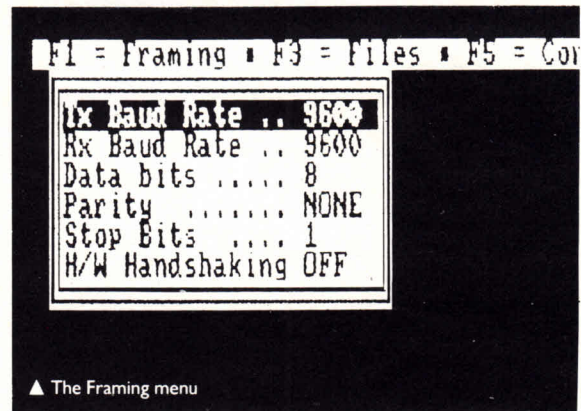
Before you start, you will need to have a 'serial interface' unit such as Amstrad's CPS8256. This is a box which slots onto the back of the PCW, over the expansion socket. Serial interfaces are sometimes called 'RS232' interfaces, which explains the enigmatic '232' at the end of MAIL232's name.

To run the program, boot up CP/M normally and wait until you get the usual A>prompt. Now put your copy of side 1 (the LocoScript side) of the master discs into the drive and type MAIL232[RETURN].

The program uses LocoScript-style menus, although there are subtle differences in the way they work. Across the top of the screen you will see a menu bar, where [f1],[f3],[f5] and [f7] are all listed. Pressing one of those function keys will bring a menu down, and the cursor keys with + and - make the settings. Press [EXIT], not [ENTER] as per LocoScript, to clear a menu away.

The first thing you do with any comms program is to set up the line speed, parity and so on. This is done with the 'framing' menu of MAIL232.

Press [f1], and the menu drops down, use the cursor keys to get to the choice you want, and then as you press + and - the settings will be changed on the menu for you. When they are as you want, press [EXIT]. You will have to find out what the correct settings are by asking the person or system you're trying to connect to - the sender's and receiver's



▲ The Framing menu

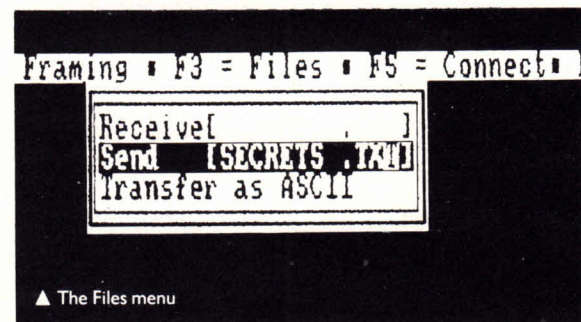
settings must be identical.

When you have set up, get your modem running and dial the service you are going to use. You can now type away; if you have set the speeds up correctly, everything you type will be sent to the other end of the line, and the replies will appear on the screen.

Saving your messages to disc

Typing text in and reading the replies is all very well, but doesn't work for long messages. You want to be able to store long replies in files to print out and peruse later on; also, you want to be able to send previously prepared text files to avoid typing 20 pages of text while your phone bill ticks away.

The [f3] menu does this for you. Sending a previously prepared text file is the easier option: move the cursor to 'Send' and type in the filename. It must be a file on your currently logged drive, and you can't use names like 'B:FRED' to get to a file on drive B if you are logged onto drive A. When the name is correct, press [ENTER] to send



▲ The Files menu

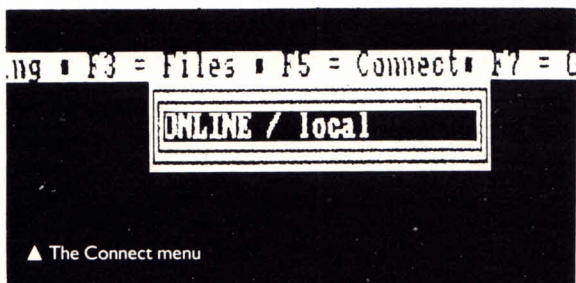
it. Your screen will not necessarily show the file as it is transmitted,

To receive long messages, you type the name of the file in which you wish to save the incoming text in the 'Receive' slot. So type in all the commands needed for the host system (the one you've rung) to send the text to you, but don't press the crucial [RETURN] to start it transmitting. Press [f3] and set up the receiving option, and when you press [ENTER] MAIL232 is ready to receive. You are now back in 'chat' mode, so press the final [RETURN] to start the host's transmission. Any text that MAIL232 receives is now stored in the named file. Pressing [ALT]+[STOP] together stops the saving process and closes the file.

There are two more function keys to be used, [f5] and [f7]. [f5] connects or disconnects MAIL232 from the communications line: use + to switch between the two states, and [EXIT] to finish. Being 'Online' means you are able to send and receive data, and being 'Local' means that nothing you type is actually transmitted. Local isn't a particularly useful mode to use.

Finally, the [f7] key covers two functions. The 'Return to CP/M' option is self-explanatory - just put the cursor over it and press [EXIT]. The other option on the menu, 'Z19/VT52 Emulation' is a little more obscure.

If you have ever worked with larger computers, like PDPs or VAXes, you will know that a standard kind of terminal to use with them is called a VT52. Z19 is a very similar terminal emulation, produced by a different company. With MAIL232 set to this mode, you should be able to use it as a terminal to one of these more powerful computers, which you might use at work.



MAIL232 is not a particularly sophisticated communications program, but it will just about do all the vital functions. As you come to use comms services more, you will find that buying better software (such as that mentioned in our comms feature this month) saves a lot of hair-tearing.

Life! Don't talk to me about Life...

Every computer has its little in-joke planted somewhere by the designers, and on the PCW it is to be found in the MAIL232 program. This was first mentioned in Tip-Offs in the March 1987 issue.

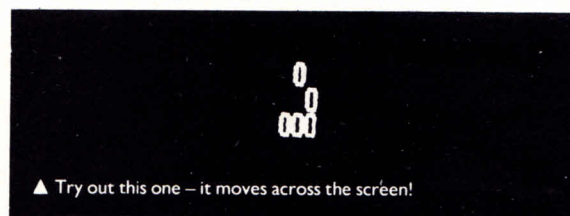
'Life' is a mathematical game. The idea is that you have a colony of bacteria which are evolving over the course of several generations. In each new generation, some bacteria die and some are created. A bacterium dies of overcrowing if there are more than three other bacteria around it, and dies of loneliness if there are less than two neighbours.

A given bacteria will be alive in the next generation if it has exactly two or three neighbours. If an empty space has exactly three neighbours, then a bacterium is created in that space in the next generation.

So to 'play' Life you set up an initial pattern of bacteria on the screen, and watch as the computer trundles through the generations. The idea is to find a starting pattern which does interesting things: it should grow, or move, or anything other than just die out, as most do.

What of MAIL232 in all this? If you bring up the [f3] menu, move the cursor to 'Transfer as ASCII' and press [EXTRA]+P, the screen will clear and prepare to play Life. Now use the cursor keys and the [RETURN] key to set up an initial pattern. When you press the space bar, the PCW will roll through the generations, until you press space again to stop it.

Have fun, and long may your bacteria divide.



Transferring .COM files

There is a final option on the [f3] menu, labelled 'Transfer as ASCII'. With the +key you can turn this to 'Transfer as HEX' and back. For sending text files, as you will normally want to do, don't alter this from the ASCII setting.

However, you can't normally transmit .COM files (or any 'binary' file) with MAIL232. If you are connecting directly with a friend who wants to send/receive a .COM file (for instance to copy a file from a bulletin board) you will need to set to 'Transfer as HEX'. This is only useful for transferring .COM files with other PCW owners, as it is only MAIL232 that uses this type of transfer.

If you do transfer files with the HEX option, once received they will need converting back into .COM format. To do this you will need to use the CP/M utility HEXCOM: edit any rubbish data out of the received file (suppose you call it FRED.HEX), and then the command HEXCOM FRED will create a runnable FRED.COM file from the FRED.HEX file.

Copying MAIL232.COM

The reason MAIL232.COM is on side 1 not side 2 of the discs is just space - side 2, with the rest of the CP/M programs, is full of other things.

It makes sense to transfer the file from your LocoScript disc on to your CP/M one. First, make sure you have enough room on your CP/M one by erasing some files if necessary. You probably don't use ED.COM much, so delete that.

MAIL232 is literally hidden on the LocoScript disc. In CP/M terms, it has been declared as a 'system' file, although you can run it normally, it will not show up on directory listings, nor will PIP copy it without a special command.

To copy MAIL232, you need to use PIP's [R] option. Assuming you are copying it from a disc on drive B to one in drive A, the command is

```
PIP A:=B:MAIL232,COM[R]
```

The [R] suffix tells PIP that MAIL232 is a system file. Now you can erase MAIL232 from your LocoScript disc, giving yourself an extra 4k of space there.

The new copy on the A disc will still be a system file. If you want to make it into a normal file (a 'directory' file) so that it will appear in future DIR listings, you must give the command

```
SET MAIL232.COM [DIR]
```

You will need to have the file SET.COM on your current disc.

Two by Two

Build your own columns with our two-column printer, illustrate your thesis with a graph, or scroll text across the screen

TWO-COLUMN PRINTING

This program takes your LocoScript document and prints it in two columns in one run. More importantly, it comes out perfectly aligned (not easy with the old dual pass method) and even prints the correct page number at the bottom.

The listing works on an ASCII file, so you lose all LocoScript's fancy type commands, but you can't expect everything from 47 lines of Basic. Type in the listing and save it to disc before preparing your LocoScript document.

It's a good idea to start by creating a TEMPLATE.STD for a new LocoScript group to keep all your double column writing in. Create a document called TEMPLATE.STD and press [f7] twice. The menu that appears asks about page lengths. Set the page length to 66, the header zone to 0:Position 1 and the footer zone to 11:Position 62. This should give a page body of 55. EXIT from this menu and press f1 to set the layout. Set the margins to 0 and 37 and the pitch to 12 and the template is complete.

Write your article without bold, underlining or anything fancy like that and make sure the last line of your document isn't blank.

Save it and then use [f7] to 'Create an ASCII file', making sure to choose the 'Page Image' option and save the resulting file in group 0 (CP/M, and therefore BASIC, normally only deal with files in this group).

Load BASIC and run the program. It will ask for the LocoScript file name and the number of lines on the page (between one and 55). You have the choice of printing out immediately or seeing it on screen first to make sure it looks

right (use [ALT]S to stop and continue the scrolling). The program is set to Draft Elite but you can set Near Letter Quality in the normal way, using [PTR].

```

10 CLEAR : esc$=CHR$(27) : cls$=esc$+"E"+esc$+"H"
20 LPRINT esc$;"@";esc$;"M";esc$;"d"
30 PRINT cls$ ;"TWO COLUMN PRINT OF A LOCOSCRIPT PAGE IMAGE ASCII FILE"
40 PRINT : INPUT"Filename = ",name$
50 IF FIND$(name$)="" THEN PRINT"Cannot Find. - Try again":GOTO 40
60 PRINT:INPUT"Maximum lines per page. (1 to 55) = ",num
70 IF num < 1 OR num > 55 THEN 60
80 PRINT : PRINT"Press V to view on screen or P to Print"
90 select$=UPPER$(INKEY$):IF select$="" THEN 90
100 IF select$ = "V" OR select$ = "P" THEN 110 ELSE 90
110 PRINT cls$:PRINT"Opening filn :- ";name$ : PRINT
120 IF select$="P" THEN GOSUB 400
130 :
140 lines=0 : page=1 : OPEN "I",1,name$
150 DIM a$(110)
160 WHILE NOT EOF(1) AND lines < num*2
170 lines=lines+1
180 LINE INPUT #1,a$(lines)
190 IF LEFT$(a$(lines),1)=CHR$(12) THEN GOSUB 430
200 WEND
210 lines=lines-1
220 IF lines < (num * 2) THEN GOSUB 460
230 IF num=0 THEN CLOSE 1 : ERASE a$ : GOSUB 410 :

```

How to type a listing in

The first thing is to load Mallard BASIC. Turn on your PCW, or reset it by pressing [SHIFT][EXTRA][EXIT], and put a copy of the CP/M master disc into drive A:.

When the A> prompt appears, type BASIC and press [RETURN]. After a few seconds a message about Mallard BASIC will appear on the screen, ending with the prompt 'OK'.

Type in each line of the listing very carefully, starting with the line number and finishing with [RETURN]. Be careful not to mix up capital I with the number 1, capital O with number 0 and colons with semi-colons. During a long listing, it's important to save your work every 15 minutes or so, and you should always save any listing before printing it. To do this, find a work disc with space on it, put it in the drive and type SAVE"PROGRAM"[RETURN]. Of course, you can choose any name of up to eight characters instead of 'PROGRAM'.

When you've finished, type LIST[RETURN] and the whole program will appear on the screen. Check it, and if any lines are wrong, correct them with the line editor. For example, if there's a mistake in line 100, type EDIT 100[RETURN]. Use the cursor and delete keys to correct the line and press [RETURN] when you've

finished. You can delete a whole line by typing its number and pressing [RETURN].

To run the program, simply type RUN[RETURN] and yes, the program goes wrong.

It's more than likely, no matter how carefully you typed in the listing, that it won't work properly the first time you run it. You may get an error message such as 'Syntax error in 100'. List the program out and check the screen against the original in the magazine.

Don't forget that the line number in the error message isn't necessarily where the error is - it's simply the point at which the PCW gets stuck. You may have to look elsewhere for the error.

When you find an error, either retype the complete line or use the line editor (described earlier) to correct it. Run the program again, and hopefully this time it will work. If it doesn't you have to go through the correction process again. Once the program is running correctly, save it again. To leave BASIC and return to CP/M, type SYSTEM.

Each time you want to run the program, you must load BASIC, type LOAD followed by the name of the file you saved it in, and type RUN once it's loaded.


```

GOTO 330
240 FOR x=1 TO num
250 PRINT TAB(5)a$(x);TAB(45)a$(x+num)
260 NEXT x
270 IF select$="V" THEN PRINT:GOTO 290
280 FOR k=1 TO 57-num:PRINT:NEXT k
290 PRINT TAB(41-(page < 10))page; CHR$(12)
300 lines=0 : page=page+1 : ERASE a$
310 GOTO 150
320 :
330 PRINT"Press R to re-use same file, N for a new
file, or F to finish"
340 zz$=UPPER$(INKEY$):IF zz$="" THEN 340
350 IF zz$="R" THEN PRINT cls$ : PRINT"Filename =
",name$ : GOTO 60
360 IF zz$="N" THEN 30
370 IF zz$="F" THEN PRINT cls$:NEW
380 GOTO 340
390 :
400 POKE 8793,234 : RETURN
410 POKE 8793,239 : RETURN
420 :
430 c%=LEN(a$(lines))-1
440 a$(lines)=RIGHT$(a$(lines),c%): RETURN
450 :
460 num=INT(lines/2)
470 IF lines/2 <> num THEN num=num+1
480 RETURN

```

EASTER

On the theory that it is impossible to work out the date of Easter without a computer, we rush to oblige with a program from Robert Ainsley. We have had a sudden rush of programs to perform this most mysterious of computations but the one we've chosen seems the most comprehensive. It even tells when Easter Monday is - how's that for advanced computer technology.

Mr Ainsley in his comments refers cryptically to 'an incredibly obscure formula for finding the date of Easter for any year from 1583 to 2500 due to some astronomer whose name I can't remember'. He claims that the program will work out dates from 1800-2000. We know for a fact that it works for 1987 but take no responsibility beyond that.

It's most important to remember to watch for the backslashes used at various points. This is produced with [EXTRA] and [1/2] and is not to be confused with boring old '/'.

```

10 INPUT "What year do you require the Easter date
s for";y%
20 m%=203:d%=12
30 IF y%<1900 THEN 70
40 m%=204:d%=13
50 IF y%<2100 THEN 70
60 d%=14
70 a%=y%-19*(y%\19)
80 q%=y%\4
90 z%=m%-(11*a%)
100 c%=z%-30*(z%\30)
110 IF c%=28 THEN c%=27
120 IF c%=29 THEN c%=28
130 h%=y%+q%+c%-d%
140 e%=h%-7*(h%\7)

```

```

150 easter%=26+c%-e%
160 PRINT:PRINT "In";y%;"Good Friday is on";
170 GOSUB 230
180 easter%=easter%+2:PRINT SPC(8);"Easter Day is
on";
190 GOSUB 230
200 easter%=easter%+1:PRINT SPC(8);"Easter Monday
is on";
210 GOSUB 230
220 END
230 IF easter%<32 THEN PRINT " March";easter% ELSE
PRINT " April";(easter%-31)
240 RETURN
250 "

```

GRAPHS PACKAGE

If a picture is worth a thousand words then a graph of your data must be worth a couple of thousand. We know you don't like your listings too long but here is a graphs program that may be worth the effort.

The only way to get a hard copy is to take a screen dump (EXTRA and PTR) and perhaps the labelling is a little limited, but it does provide an easy-to-use method of producing bar charts, scatter graphs or distribution curves that looks impressive on screen and in print. The graphs show each entry as a percentage of the total and various statistics, including average percentage, total, average and mean, are shown grouped in the top right hand corner of the display. You could use this program as a sub-routine in your own program to churn out figures in a really professional form.

The program is very easy to use, but remember not to use negative numbers or numbers over 99. As you can see, the listing is rather complicated, but if you take care and work through it systematically you will be delighted with the results.

```

10 e$=CHR$(27):cls$=e$+"E"+e$+"H":wh=0:p$=e$+"Y":r
v$=e$+CHR$(112):xrv$=e$+CHR$(113)
20 PRINT cls$:PRINT e$;"f";e$;"0"
30 LINE INPUT "Graph Title (max 80 ch'ters) ",t$
40 PRINT e$;"f";e$;"0"
50 PRINT:INPUT "Number of items (max 25) ",n:PRIN
T cls$: DIM a(n),b(n)
60 PRINT "Do you want (B)ar Chart - (S)catter Grap
h - (D)istribution Curve? ";
70 w$=INPUT$(1):w$=UPPER$(w$)
80 IF w$="B" OR w$="S" OR w$="D" THEN PRINT cls$:G
OTO 90 ELSE PRINT cls$:GOTO 60
90 PRINT "Entry of data ":PRINT:FOR x=1 TO n:PRINT
"Item no ";x;
100 INPUT "",a(x):b(x)=a(x):wh=wh+a(x):NEXT
110 PRINT cls$:IF w$="D" THEN GOSUB 420
120 FOR x=1 TO n:PRINT p$;CHR$(32);CHR$(40);"Value
";p$;CHR$(32);CHR$(42+3*x);b(x):NEXT
130 FOR q=1 TO n:a(q)=INT((a(q)/wh)*100):NEXT
140 FOR m=1 TO n:hp=MAX(hp,a(m)):NEXT
150 IF hp<25 THEN rg=25:f=1
160 IF hp=>25 AND hp<50 THEN rg=50:f=2
170 IF hp=>50 AND hp<75 THEN rg=75:f=3
180 IF hp>75 THEN rg=100:f=4
190 z=b(1):FOR m=1 TO n:h=MAX(h,b(m)):z=MIN(z,b(m)
):NEXT:IF rg<=50 THEN rgr=5 ELSE rgr=10

```

```

200 FOR rr=33 TO 58 STEP 5:FOR bb=10 TO 90:PRINT p
$;CHR$(rr);CHR$(32+bb);".":NEXT:NEXT
210 FOR cc=42 TO 122 STEP 20:FOR bb=1 TO 25:PRINT
p$;CHR$(32+bb);CHR$(cc);"." :NEXT:NEXT
220 FOR bb=1 TO 26 STEP rgr:PRINT p$;CHR$(32+bb);C
HR$(42-1);rg-((bb-1)*4#rg/100):NEXT
230 IF w$="B" THEN 240 ELSE IF w$="S" THEN 270 ELS
E 290
240 FOR x=1 TO n:FOR r=(58-((INT(a(x)/f))+0.5)) TO
58
250 PRINT rv$;p$;CHR$(r);CHR$(42+1+3*x);" ":NEXT:
PRINT xrv$:NEXT
260 GOSUB 470:GOTO 370
270 FOR x=1 TO n:r=(58-((INT(a(x)/f))+0.5)):PRINT
p$;CHR$(r);CHR$(42+1+3*x);" *":NEXT
280 GOSUB 470:GOTO 370
290 PRINT p$;CHR$(34);CHR$(103);"Total Value=";wh;
p$;
300 PRINT CHR$(35);CHR$(103);"Max Item ="h;p$;
310 PRINT CHR$(36);CHR$(103);"Min Item ="z;p$;
320 PRINT CHR$(37);CHR$(103);"Avge Value =" ;USING
"###.###";wh/n:PRINT p$;
330 PRINT CHR$(38);CHR$(103);"Avge %age =" ;USING
"###.###";(wh/n)*100/wh
340 PRINT p$;CHR$(39);CHR$(103);"Mean Value =" ;b(n
/2)
350 FOR x=1 TO n:FOR r=(58-((INT(a(x)/f))+0.5)) TO
58
360 PRINT rv$;p$;CHR$(r);CHR$(43+3*x);" ":NEXT:PR
INT xrv$:NEXT
370 FOR x=1 TO n:PRINT p$;CHR$(32+27);CHR$(42+3*x)
;x:NEXT
380 FOR t=5 TO LEN("Percentage")+5:PRINT p$;CHR$(3
2+t);CHR$(39);MID$("Percentage", (t-4), 1):NEXT
390 PRINT P$;CHR$(32+27);CHR$(40);"Class";
400 PRINT p$;CHR$(32+28);CHR$(32+(INT((90-LEN(t$))
/2)));t$;e$;"e"
410 END
420 s=1:flag=1
430 WHILE flag=1 AND s<n:flag=0
440 FOR v=1 TO n-1 :IF a(v)<a(v+1) THEN SWAP a(v),
a(v+1):SWAP b(v),b(v+1):flag=1
450 NEXT:s=s+1

```

```

460 WEND :RETURN
470 PRINT p$;CHR$(34);CHR$(103);"Total Value=";wh;
p$;
480 PRINT CHR$(35);CHR$(103);"Max Item ="h;p$;
490 PRINT CHR$(36);CHR$(103);"Min Item ="z;p$;
500 PRINT CHR$(37);CHR$(103);"Avge Value =" ;USING
"###.###";wh/n
510 PRINT p$;CHR$(38);CHR$(103);"Avge %age =" ;US
ING "###.###";(wh/n)*100/wh
520 GOSUB 420:PRINT p$;CHR$(39);CHR$(103);"Mean
=" ;b(n/2)
530 RETURN

```

MOVING WRITING

Have you ever yearned to write something that was really moving? Well here's the easy way to do it: for one thing this listing must surely be short enough for anyone to attempt, and for another it really is fun to see words dancing across the page. They actually leap from the side of the screen and dash across until they reach the centre where they know exactly where to stop. Fantastic!

You put your own text starting on line 90 making sure that you still finish with a '++' line. You can even change the position on the page by changing the variable 'row' in line 10.

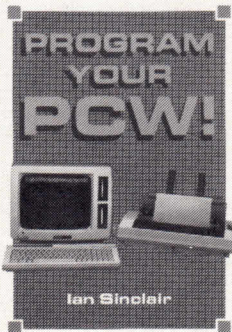
Use this in your own program and no-one will be able to ignore your prompts.

```

10 move.any$ = CHR$(27) + "Y":row=12:col=0
20 PRINT CHR$(27)+"H"+CHR$(27)+"E"
30 READ a$:IF a$ = "++" THEN END
40 a$=STRING$( (85-LEN(a$))/2, " ") +a$
50 FOR i=LEN(a$) TO 1 STEP -1
60 PRINT move.any$;CHR$(32+row);CHR$(32+col);MID$(
a$,i,80)
70 NEXT i
80 row=row+2:GOTO 30
90 DATA This is a simple program
100 DATA to enable
110 DATA text to move across
120 DATA the screen
130 DATA ++

```

GLENTOP

MALLARD BASIC
ON
AMSTRAD PCW/256/S12

Second Edition

PROGRAM YOUR PCW!

by Ian Sinclair

This book is about how to use Mallard BASIC on Amstrad's PCW computers. It starts out from the very beginning, assuming you know nothing about Basic or programming. In easy stages, it takes the reader through displaying messages on the screen, data statements, formulae and functions, loops, and string handling.

Later chapters deal with subroutines and with data files.

Both serial files and random-access files using JETSAM are explained in easy to understand terms.

By the end of the book, readers should be able to write programs suitable for their own special needs, be they in business or in the home.

Available from The Amstrad User

Normal Price \$27.95 - Subscriber's Price \$25.95

(plus postage and packing - see page 64)

Creating an Auto-Start disc for Basic

by J.G. Boers

While the PCW is a very handy computer it fails, apparently, in automatically loading BASIC. This is not caused by oversight but in order to give you a more versatile machine. Therefore, the thing to do is to make your own auto-start disc for BASIC.

To do so select a blank side of a disc, format it if this is not already done, then follow the steps set out below. Alternatively you can copy side 2 of the system discs, erase all files except those listed in step 3 and then follow on from there.

When using the PIP command to copy ".COM" files make sure that you use the "[o]" added to the filename as shown in Step 3 since omission of this can cause many unexplained errors, both in CP/M and application programs, such as valid commands not working as anticipated. This is due to the fact that command files can contain apparent EOF markers before the end of file is reached. The "[o]" overrides this and checks, on directory entries and statistics for the file, that the complete file is transferred without omissions. Follow the steps as set out and you will not have to load your system disc side 2 again just to use BASIC. One last item that needs mention is that RPED runs from Basic but returns to CP/M.

- STEP 1 :put system disc in drive to run on side 2, as this contains all relevant files.
- STEP 2 :type PIP [Return]
- STEP 3 :at the "*" prompt type the following commands but wait for the "*" prompt to re-appear before entering the next command
- ```
m:=j14cpm3.ems[o] [Return]
m:=submit.com[o] [Return]
m:=basic.com[o] [Return]
m:=rped.bas[o] [Return]
DO NOT press [Return] again when the "*" prompt appears.
```
- STEP 4 :wait for the disc to completely disengage, take system disc out and insert prepared disc.
- STEP 5 :the prompt should still be "\*". Now type in a:=m:\*.\*[o] [Return]. This will copy all files on m: to a:. At the "\*" press [Return] to get back to CP/M
- STEP 6 :reset computer by holding [shift] and [extra] and pressing [exit]. The screen should blank then start as usual to the "A>" prompt. If this does not happen then restart from step 1.
- STEP 7 :if all is well start BASIC as you usually would and at the basic prompt, "OK", type in run "rped

[Return]. This enters the editor as described in the April issue of The Amstrad User. If you are unfamiliar with it try a few things in it before starting step 8.

- STEP 8 :use the f3 option to create a new file. This file MUST be called PROFILE.SUB. No other name is acceptable as no other will cause the functions required to be performed. Try another name if you must but you will be disappointed.
- STEP 9 :you have a choice of three files depending on your requirements and also if you have typed in or want to use the AUTO-MENU program from the April issue.
- Option 1 : basic [Return]  
This is all the text you need if you just wish to enter BASIC without any other action at cold start.
- Option 2 : dir \*.bas [Return]  
basic [Return]  
This will display the directory of basic programs on disc before entering basic.
- Option 3 : basic automenu [Return]  
This will enter basic and immediately start the menu program once you have copied this onto the disc providing this is the name you have given it. Otherwise either rename the file or substitute your filename for automenu.
- STEP 10 :exit editor by pressing [exit].

This completes the auto-start BASIC disc and still allows quite reasonable amount of space for often-used program stubs on this side of the disc.

If you wish to test it then simply reset the computer to simulate a cold start. Don't worry if you have included automenu in the commands and not yet on the disc, as this will only cause an "unknow file" error message and after which the basic prompt will appear. You can also still start BASIC on this disc as usual once CP/M has been loaded from another disc. If you wish to use this on another language, i.e. LOGO, substitute LOGO.COM for BASIC.COM in step 3, the PROFILE.SUB file will now read : LOGO as it is impossible to read the directory first due to a clear-screen command in the LOGO loader. The PROFILE.SUB file will have to be created in basic using RPED and saving this on m: then copying this to your new LOGO disc.

Though there is much more that can be achieved with the use of submit and command files this is sufficient for now.

# Hot Tips

This new section could be the start of something big  
..... over to you "hackers"!

Now that the CPC machines have been out for over a couple of years, there must be many Amstrad Basic programmers who have got to the 'advanced' stage of programming. That doesn't necessarily mean that they can produce hundreds of lines of complex coding - rather, they have discovered clever ways of doing things.

This new column will present some of the better ideas - but we rely upon the 'hackers' to keep it going. As usual, a monetary incentive is provided for all published items. Remember that they must be your original work.

## DATA from nowhere

After running the program below, you should find on your disc or tape a file called DATA.BIN. To load it into memory, type `MEMORY 42000:LOAD"DATA.BIN"`.

What on earth does the program do? Well, if you have an area of memory full of code, and you wish to convert that to a list of DATA statements, then this is for you. The syntax for creating the DATA statements is:

```
CALL 42001, <start address>, <number of lines>
```

where start address is the memory location where all the bytes you wish converted to DATA statements are stored. Number of lines refers to the number of Basic DATA statements that will be produced.

So, for example, this line will cause the bytes from address 7000 to be produced within six DATA statements:

```
CALL 42001,7000,6
```

Type in the listing and you should be well away. Data lines will be produced identical to these:

```
1 'Code to Data Statements
2 'The Amstrad User July 1987
10 lin=11:size=(20*lin)-1:add=42001
20 FOR mark=add TO add+size
30 READ a$:IF LEN(a$)=4 THEN GOSUB 120
40 byte=VAL("&"+a$):tot=tot+byte
50 POKE mark,byte
60 NEXT mark
70 'De-REM the following two lines if your machine is a 6
```

```
64 or 612B
80 POKE &A418,&66:POKE &A49F,&66:POKE &AEA2,&68
90 POKE &AEA9,&6A:POKE &AEAC,&6C
100 SAVE "data.bin",b,add,size
110 END
120 chk=VAL("&"+a$):IF chk<>tot THEN PRINT "Error in data
";PRINT CHR$(7):END
130 READ a$:tot=0:RETURN
140 DATA 21,00,00,22,d9,a4,2a,83,ae,2b,2b,dd,56,03,dd,5e,
02,dd,46,00,0707
150 DATA c5,cd,30,a4,c1,10,f9,cd,78,a4,c9,3e,47,77,23,23,
73,23,72,23,094f
160 DATA 3e,8c,77,23,3e,20,77,23,06,14,c5,cd,af,a4,e5,2a,
d9,a4,3a,d8,08f9
170 DATA a4,4f,06,00,09,22,d9,a4,e1,c1,3e,2c,77,23,10,e6,
dd,21,d9,a4,08b8
180 DATA dd,7e,01,cd,b4,a4,dd,7e,00,cd,b4,a4,3e,00,dd,77,
00,dd,77,01,09e8
190 DATA 77,23,c9,3e,0a,77,23,23,73,23,72,23,3e,bf,77,23,
3e,22,77,23,0624
200 DATA 3e,a4,77,23,3e,4a,77,23,3e,54,77,23,3e,00,77,23,
77,23,77,23,05d6
210 DATA //,22,83,ae,22,85,ae,01,09,00,09,22,87,ae,22,89,
ae,c9,1a,32,06f7
220 DATA d8,a4,13,06,00,4f,cb,1f,cb,1f,cb,1f,cb,1f,e6,0f,
fe,0a,30,06,07bf
230 DATA c6,30,77,23,18,04,c6,37,77,23,78,fe,01,c8,79,06,
61,18,e7,e7,07e8
240 DATA 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
00,00,00,00,0000
```

## Bordering on superdazzle

Seeing an attempt in a back issue at making a 'dazzling border' made me laugh. Here is a Basic program which will give you a much better effect. It will continue dazzling no matter what the computer is doing!

```
10 FOR t=&8000 TO &801C: READ a$
20 POKE t,VAL("&"+a$):NEXT t
30 CALL &8000
40 DATA 21,15,80,c3,e3,bc,06,7f,0e
50 DATA 10,ed,5f,e6,11,f6,40,ed,49
60 DATA ed,79,c9,00,00,00,00,00,81
70 DATA 06,80
```

### Moving Basic

I am amazed that nobody has come up with a poke to change the start address of Basic. Here is my offering. Just poke the locations below with the required new memory position.

#### 464 users:

```
POKE &AE81, lowbyte
POKE &AE82, highbyte
POKE &AE83, lowbyte + 3
POKE &AE84, highbyte
POKE &AE85, lowbyte + 3
POKE &AE86, highbyte
POKE &AE87, lowbyte + 12
POKE &AE88, highbyte
POKE &AE89, lowbyte + 12
POKE &AE8A, highbyte
```

#### 664 or 6128 users:

```
POKE &AE64, lowbyte
POKE &AE65, highbyte
POKE &AE66, lowbyte + 3
POKE &AE67, highbyte
POKE &AE68, lowbyte + 3
POKE &AE69, highbyte
POKE &AE6A, lowbyte + 12
POKE &AE6B, highbyte
POKE &AE6C, lowbyte + 12
POKE &AE6D, highbyte
```

### Muddling modes

Did you know it is possible to mix modes on the screen without having any fancy interrupts going? No, well read on. If you own a 464 then type in direct mode the following:

```
MODE 2
POKE &B1CF, &C0:POKE &B1D0, &30
POKE &B1D1, &0C:POKE &B1D2, &03
POKE &B1C8, 1
```

#### For owners of 664s or 6128s:

```
MODE 2
POKE &B7C6, &C0:POKE &B7C7, &30
POKE &B7C8, &0C:POKE &B7C9, &03
POKE &B7C3, 1
```

These pokes actually alter data used by the Basic operating system to tell it which mode is currently in effect and other information regarding screen layout.

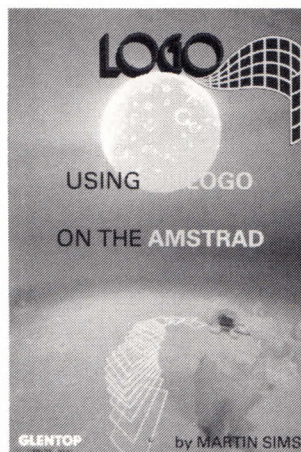
Unfortunately, 664 or 6128 owners will not get quite the desired effect. The image will appear blurred. Perhaps somebody out there knows differently - if so please send in details.

The listing in the next column, for 464 owners only, will allow you to display text in Mode 2 that is of any Mode size. For example, 80 characters can be displayed in one line in Mode 2; the program below will allow both 40 and 20

columns of text. The new commands available are MODE2, MODE1 and MODE0.

One restriction to note, though: make sure you are in Mode 2 before using the routine; otherwise strange effects will result.

```
1 'Mix Modes
2 'The Amstrad User July 87
10 FOR t=&8000 TO &806B:READ a$
20 v=v+VAL("&"a$)
30 POKE t,VAL("&"a$):NEXT
40 IF v<> 10180 THEN PRINT "ERROR": STOP
50 MODE 2:CALL &8000
60 PRINT "Commands available: "
70 PRINT" Mode2, Mode1 and Mode0"
80 DATA 21,0a,80,01,0e,80,cd,d1,bc,c9
90 DATA 00,00,00,00,19,80,c3,29,80,c3
100 DATA 3a,80,c3,4b,80,4d,4f,44,45,b2
110 DATA 4d,4f,44,45,b1,4d,4f,44,45,b0
120 DATA 00,21,c8,b1,36,02,21,5c,80,11
130 DATA cf,b1,01,08,00,ed,b0,c9,21,c8
140 DATA b1,36,01,21,64,80,11,cf,b1,01
150 DATA 04,00,ed,b0,c9,21,c8,b1,36,00
160 DATA 11,68,80,11,cf,b1,01,04,00,ed
170 DATA b0,c9,80,40,20,10,08,04,02
180 DATA 01,c0,30,0c,03,aa,55,7c,e6
```



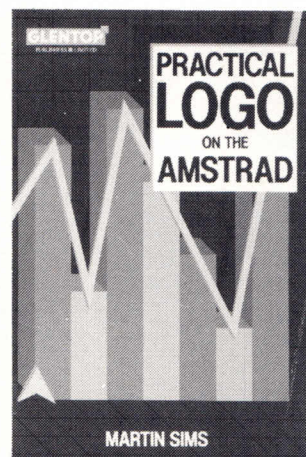
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(See Page 64 for ordering details)

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Suitable for CPC machines with CPM 2.2, this book makes learning LOGO fun, delving into Sound, Colour, Text and Graphics. Applications range from interactive games, simple arithmetic tests to random poetry generation.



# Adventurer's Attic

by Philip Riley

Yes here it is, at long last - the map of the game of Forest at Worlds end. It was originally drawn by Steve Alatakis and redrawn for the Editor by myself. I will tell you it is an adventure in itself just to get this column printed but as always the powers of good (that's me) have triumphed over the powers of evil (that's the editor). All I can say now is that I hope that I have reproduced the map correctly as some of the original provided by Steve was not too clear. If anybody does find any mistakes in it maybe they could let us know.

Now for an important announcement regarding Hint Sheets announced on page 58 of the May '87 issue. *The Sheets that you send in must be your own.* We have had a couple sent in that have been released by software houses; not only is this cheating but we cannot publish them without getting into trouble. So please send only your own hints into us, after all real adventurers don't cheat.

As well as the map below, I have included a pretty comprehensive review by Adrian Booth of Infocom's

"Infidel". Infocom normally produce good adventures (a few have been reviewed in this mag. in the past), so see what Adrian has to say about it.

You may remember a few months back we looked at an adventure base that was sent into us by one of our readers, next month we will be looking at a few different bases that I have used plus a some ideas that could be worth following up.

So until then keep fighting the power of evil and darkness and, of course, keep writing to Adventurers Attic.

## Forest at World's End

From an original drawing by Steve Alatakis

1. Farm House  
 2. Farm Track  
 3. Great Valley  
 4. Vale of Shadows  
 5. Forest  
 6. Woodman's clearing  
 7. Woodman's Hut  
 8. Leafy Glade  
 9. Burnt-out Farm  
 10. Fruit Grove  
 11. Forest Path  
 12. Western edge of chasm  
 13. Eastern edge of chasm  
 14. Tangle of undergrowth  
 15. Open Plain  
 16. High plateau  
 17. Western bank of River  
 18. Old well  
 19. Wooded Vale  
 20. Eastern bank of River  
 21. Marshy ground  
 22. Swamp  
 23. Enchanted wood  
 24. Forest of Sighs  
 25. Rocky out-crop  
 26. Brink of precipice  
 27. Bottom of precipice  
 28. Wildmoor Woods  
 29. Forest of night  
 30. Rock Wall  
 31. Cavern of Silence  
 32. Rock Passage  
 33. Great Hall  
 34. Dungeon  
 35. High Tower  
 36. Marls Gateway  
 37. Plain of Marl  
 38. Blacksmith's Forge  
 39. Base of Volcano  
 40. Ledge on side of Volcano  
 41. Top of Volcano  
 42. Witches Hovel

# Infidel

Infocom's adventure reviewed by Adrian Booth

If you have ever wanted to explore Ancient Egypt, have a fascination with pyramids and pharaohs, or simply like being eaten alive by 6,502 rats, then Infocom's "INFIDEL" is the game for you. In this game you play the role of a small-time explorer and archeologist who being, shall we say, a fairly unsavoury character, has managed to create such a dislike for you in your Egyptian workers (who were to help you find the pyramid) that they have deserted you, leaving you alone in the desert. The first sentences of the farewell note that they leave for you say it all: "Fi amam Allah! Hereafter you shall pursue your fool dream of the hidden pyramid and its riches alone! May the jackals feed well upon your bones...."

Find the pyramid? You thought that they were all discovered, didn't you? Well, you were wrong. Another archeologist, a Mr. Ellingsworth, found in 1920 a 5,000 year old cube that pointed to the existence of another pyramid, which he promptly dubbed "The Lost Pyramid". You have, by virtue of a few white lies, got yourself in charge of an expedition to find this pyramid. Now, you are alone in the searing heat of the Sahara. Your resolve? To find, get into, and explore the pyramid, and get out with, as the game package says, ".....enough to keep you rolling in filthy lucre for the rest of your born days.

This game package is, as is usual for Infocom, of the very highest standard. It includes your expedition log, the instruction manual, a hieroglyphic rubbing, a partial hieroglyphic dictionary, an old map of the expedition site (authentically dry and crackly), some personal correspondence of yours, a reference card for the computer you are using, and no less than four pieces of real-world advertising hype, including your "Imagineering Software Warranty Policy". A lot of useless junk? You need the map and the hieroglyphic rubbing/dictionary. The rest just adds to the atmosphere....but I think that these things should be expected from an adventure that costs 50 bucks. WHAT? FIFTY BUCKS? That's right, fifty bucks. But believe me, it is worth it

if you like to get realism, a massive parser, and tremendous location descriptions from your adventures.

As mentioned, a partial hieroglyphic dictionary is included. This is because, scattered throughout the pyramid, are messages kindly left by the builders of the pyramid about how to get through the various traps and blocks to your progress. Of course, the Egyptians wrote in hieroglyphics...so get ready for some late night "what does THAT mean?" thinking. These hieroglyphics add a lot to the adventure. However, you shouldn't try to decode every symbol; just writing down each message as you find it, and looking to see where the same symbol occurs in another message, can narrow down your possible courses of action dramatically.

A fun part aspect of the program that I like is the way the program keeps score. If you have less than 100 (out of a possible 400), you are ranked as "a bumbling beginner". A score in the range 100-200 gives you the ranking of "a poor professor". The next highest score rating (200-300) results in the rank "a fairly good looter". The next highest ranking? Unfortunately, I don't know yet!

You can also get some fun, and not so fun, messages when you perform (sometimes silly) actions. The response to "KISS..." is "I'd sooner kiss a pig." A not so fun message - the response to EXAMINE ROPE - is something like this: "It's about 30 feet long, is made of the finest Manila hemp, and is guaranteed to hold at least 250 pounds. Be glad the workers didn't hang you with it".

The accompanying blurb on the package says, in part, "...death will lick at your heels as you race to the shattering climax of this match of wits between you and the most ingenious architects, builders and murderers of all time - the ancient Egyptians". Lick at your heels, they say! It is only a slight exaggeration to say that you can die trying to solve 60%+ of the puzzle in this game. You can be crushed to death, burned alive, or, as previously mentioned, eaten alive by rats. The hieroglyphics do help; but despite what I said earlier, who reads them anyway?

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You tend not to think about them properly until you have tried (and died trying) the obvious course of action. If I do have a complaint about this adventure, it is this: you could NEVER possibly solve it without dying in the process. This, to me, goes against the realism of the adventure.

Don't expect to finish this game in a day, or even a week. You will probably, in fact, die (of thirst) the first few times you play it. Don't worry: take the time to explore your campsite thoroughly. You need at least something from each of the three tents to complete this adventure.

I have so far found 48 locations within the pyramid itself, and a total of about 40 objects in the game. This, however, says nothing for the complexity of some of the puzzles. Most are easy, though, once you know them. Make sure you EXAMINE everything! (This can be achieved quite easily by using the command EXAMINE ALL. The documentation says that this won't work, but it does).

I have a book that contains a review of this adventure. No plagiarism intended, but it says in part that "...the best possible outcome is to find the sarcophagus, open it, drool over its

riches - and then die." (That is, even when you get a perfect score, it still kills you). I confess that I am not quite finished yet, and so could not testify to this. However, I think that knowing that such an ending awaits you could dampen your enthusiasm a little (so why did I tell you? you ask). But the flow of adrenaline I felt when I finally opened the Burial Chamber door and went through it was staggering. It may help to know that when you perform the correct action to solve a puzzle, the program in many cases responds "Consider it done. You...<do whatever>". The simple message "Consider it done." is an amazingly welcome sight after spending the better part of a fortnight trying to get into the burial chamber. (In fact, it is quite simple to do: I continually tried the right action but on the wrong THING).

My conclusion? Perhaps I may have been happier with Hitchhiker's Guide to the Galaxy, which was an alternative of mine. If you only want to buy one Infocom adventure in your life, then I would not recommend this one. However, if you like adventuring, want more than a two word parser and three-line room descriptions, and have

dollars to spend, then it comes with my recommendation. It has many fine features, but is certainly not the best Infocom adventure. If you have a fair experience of adventuring, you could perhaps start your experience with Infocom with this one (as it seems to require pure, solid logic to solve it), thus bypassing the staple of ZORK, and then move onto better and better adventures. But then, if a good adventure is one that holds your attention, keeps you from doing other things that you should be doing, gets the adrenaline flowing, and keeps you up until 2 a.m., then this one is good. Infocom's are the best, which is perhaps why I was just slightly disappointed with this one. This adventure, in the final analysis, could be seen as being representative of a lower level of the highest standard available.

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# Being flash with colours

by Ian Barnes

In this month's article, we will be looking at the use of hidden colours to generate effects in BASIC which would otherwise be impossible, animating whole screens, and producing the apparent movement of large areas of a picture. I will also show how the use of interrupts plays an integral part in these procedures.

Hidden colours are possible in Modes 0 and 1, but can only be used to full effect in Mode 0, and so this is the Mode that this article will consider. Hidden colour effects rely on the fact that it is possible to use 16 different 'inks' in Mode 0, and that each of these 'inks' can be set to any of the 'real' colours by use of the INK 'ink', 'real' command.

So if the commands INK 0,0:INK 15,0 are entered; ink number 15 will be displayed on the screen as black, as will the background (ink 0). This means that anything drawn with ink 15 will not show against the background until ink 15 has been altered to another colour.

This can be done for the other inks (1-14) making it possible to have 15 different pictures hidden on the screen, to be shown when the ink is changed. Of course, each pixel can only store one ink at a time, so if 15 different pictures are drawn over the same area only the latest one will be complete. The previous pictures having blank areas where they have been drawn over.

Listing 1 is a fairly short demonstration program of the effects that can be achieved using flashing colours. Altering line 330 to read:

```
330 INK i,18:INK j,19:INK k,9
```

will let you see how this effect is achieved. The triangles are drawn at the quickest rate that the Amstrad can draw them from BASIC, and interrupts (in the form of an EVERY 4 GOSUB330) are used to flash the colours. As new triangles are drawn and the very old triangles are erased, those triangles that have been drawn previously will be drawn over. This gives the effect of the older triangles fading out. The effect produced by this small program is fascinating, and looks best in a darkened room.

Interrupts are used in all the demonstration programs because of the advantages they offer. The command EVERY n GOSUB xxxx will result in the sub-routine at xxxx being called every n\*1/50 seconds. It is important to make these routines as short as possible, as otherwise they will take up most of the computer's time.

Setting inks to different colours is an ideal use for interrupts as it takes very little time. Listing 2 demonstrates

```
1 ' Listing 1
2 ' Triangles
3 ' By Ian Barnes
4 ' The Amstrad User, 1987
10 KEY 135,"mode 2:pen 1:paper 0:ink 1,26:ink 0,0:list"+CHR$(13)
20 MODE 0
30 BORDER 0
40 INK 0,0
50 INK 1,9:INK 2,12:INK 3,18:INK 4,9:INK 5,9:INK 6,9:INK 7,9:INK 8,9:INK 9,9:INK 10,9:INK 11,9:INK 12,9:INK 13,9:INK 14,9:INK 15,9
60 DEFINT a-z
70 DIM a(100),b(100),c(100),d(100),f(100),g(100)
80 p=0:e=1:i=4:j=5:k=6
90 EVERY 4 GOSUB 330
100 a=RND*600+20:b=RND*360+20
110 c=RND*600+20:d=RND*360+20
120 f=RND*600+20:g=RND*360+20
130 v=(INT(RND*5)-2)*4:IF v=0 THEN 130
140 w=(INT(RND*5)-2)*4:IF w=0 THEN 140
150 x=(INT(RND*5)-2)*4:IF x=0 THEN 150
160 y=(INT(RND*5)-2)*4:IF y=0 THEN 160
170 r=(INT(RND*5)-2)*4:IF r=0 THEN 170
180 s=(INT(RND*5)-2)*4:IF s=0 THEN 180
190 GOSUB 260
200 a=a+v:IF (a<10 OR a>635) THEN v=-v
210 b=b+w:IF (b<10 OR b>390) THEN w=-w
220 c=c+x:IF (c<10 OR c>630) THEN x=-x
230 d=d+y:IF (d<5 OR d>395) THEN y=-y
240 f=f+r:IF (f<5 OR f>630) THEN r=-r
250 g=g+s:IF (g<5 OR g>395) THEN s=-s
260 e=e-1-(e=1)*15
270 IF INKEY#="" THEN 190 ELSE 130
280 MOVE a,b:DRAW c,d,e:DRAW f,g:DRAW a,b
290 a(p)=a:b(p)=b:c(p)=c:d(p)=d:f(p)=f:g(p)=g
300 p=p+1+(p=50)*51
310 MOVE a(p),b(p):DRAW c(p),d(p),e:DRAW f(p),g(p):DRAW a(p),b(p)
320 RETURN
330 INK i,18:INK j,19:INK k,0
340 k=j:j=i:i=i-1:IF i=0 THEN i=15
350 RETURN
```

how these effects can be used. A train track is drawn on the screen, and the sleepers are drawn using 5 different colours, and then interrupts are used to produce the effect of the track moving.

Note that BASIC is just performing a 920 GOTO 920 over and over again as the track is moving, making the use of interrupts fairly meaningless. If you type in Listing 2 with the correct line numbering, you will now be able to complete the program by adding to Listing 2 all the lines in Listing 3.

With Listing 3 merged in, the program will draw a simple picture of a train on the tracks, while the tracks are in motion. The steam from the train will also be animated by the use of flashing colours with a second interrupt routine which is running at a slower rate than that which produces the track motion. In the background of the picture, BASIC will be drawing a few things just to show that it is possible to

```

1 ' Listing 2
2 ' Train Tracks
3 ' By Ian Barnes
4 ' The Amstrad User Jul 1987
10 MODE 0
20 INK 0,2:INK 1,9:INK 2,0:INK 3,13:INK 4,25
30 INK 5,1:INK 6,2:INK 7,3:INK 8,4:INK 9,5:INK 10,6
40 INK 15,12:INK 14,6
50 DEFINT f,g,h,i,j,k
60 f=13:g=11:h=12:i=5:j=6:k=7
70 FOR loop=0 TO 200:MOVE 0,loop
80 DRAW 640,loop,1:NEXT
90 ORIGIN 320,0
100 c=5:co=1:w=1:r=1
110 FOR loop=200 TO 0 STEP -2
120 MOVE -w-(RND*w/4),loop:DRAW w+(RND*w/4),loop,15
130 MOVE -w,loop:DRAW w,loop,INT(c)
140 c=c+co:co=co-(co/80):w=w+1.5
150 IF INT(c)>10 THEN c=5
160 NEXT
170 PLOT -800,-800,2
180 FOR loop=100 TO 110 STEP 2
190 MOVE -loop,0:DRAW 0,200:DRAW 220-loop,0
200 IF loop=102 THEN PLOT -800,-800,3
210 NEXT
390 EVERY 4 GOSUB 950
400 EVERY 6,2 GOSUB 980
920 GOTO 920
948 ' Interrupt Routine 1
950 INK i,15:INK j,3:INK k,12
960 k=j:j=i:i=i-1-(i=5)*6
970 RETURN
978 ' Interrupt Routine 2 (Only used with Listing 3.)
980 INK g,13:g=g-1-(g=11)*3
990 INK f,26:f=f-1-(f=11)*3
1000 RETURN

```

do other things while altering the colours.

As this program demonstrates it is possible to animate large sections of the screen (in limited ways) by the use of flashing or hidden colours from BASIC. Not bad when you consider that BASIC normally has trouble moving more than one or two characters around the screen at once.

```

1 ' Listing 3
2 ' Steam Train
3 ' By Ian Barnes
4 ' The Amstrad User Jul87
220 ORIGIN 320,170
230 FOR loop=-38 TO 38 STEP 4
240 MOVE loop,20:DRAW loop,74,2:NEXT
250 FOR loop=4 TO 34 STEP 4
260 MOVE loop,66:DRAW loop,62-loop/2,3
270 MOVE -loop,66:DRAW -loop,62-loop/2
280 NEXT
290 c=11:w=28:x=210
300 FOR L=0 TO 29
310 ORIGIN x,412-L*5
320 s=40-L
330 FOR loop=-s+2 TO s-2 STEP 4

```

```

340 y=SQR(s*s-loop*loop)
350 MOVE loop,-y:DRAW loop,y,c:NEXT
360 C=C+1:IF C=14 THEN C=11
370 x=x+w:w=w-(w/4)
380 NEXT
410 ORIGIN 320,170
420 FOR loop=0 TO 16 STEP 4
430 MOVE loop*2/3,90:DRAW loop,80,4
440 DRAW 0,0:DRAW -loop,80:DRAW -loop*2/3,90
450 NEXT
460 FOR loop=76 TO 80 STEP 2
470 MOVE -16,loop:DRAW 16,loop,14:NEXT
480 FOR loop=-48 TO 48 STEP 4
490 y=SQR(2500-loop*loop):MOVE loop,-y:DRAW loop,y,2
500 NEXT
510 MOVE 10,0:FOR loop=0 TO PI*2 STEP PI/8
520 DRAW 10*COS(loop),10*SIN(loop),3:NEXT
530 MOVE 46,0
540 FOR loop=0 TO PI*2 STEP PI/8
550 DRAW 46*COS(loop),46*SIN(loop)
560 NEXT
570 ORIGIN 320,160,0,640,0,130
580 w=-80
590 FOR loop=0 TO 60 STEP 8
600 MOVE loop,w:DRAW 0,0,14:DRAW -loop,w
610 w=w+4
620 NEXT
630 ORIGIN 0,202,0,640,202,400
640 t=1:ti=-0.5
650 x=520:y=214:s=17
660 PLOT -800,-800,0:GOSUB 710
670 x=x-s/4:y=y-s/4:s=s-0.25:t=t+ti:IF s=0 THEN 740
680 PLOT -800,-800,2:GOSUB 710
690 FOR loop=0 TO 100:NEXT:IF ABS(t)=1 THEN ti=-ti
700 GOTO 660
710 v=s*t/2:MOVE x-s*3,y:DRAWR s,v:DRAWR s,0:DRAWR s,-v
720 DRAWR s,v:DRAWR s,0:DRAWR s,-v
730 RETURN
740 PLOT -800,-800,2
750 t=0:ti=-1
760 TAG
770 C=11
780 FOR loop=0 TO 7
790 FOR L=0 TO 16 STEP 2
800 PLOT -800,-800,C
810 MOVE loop*32,L:PRINT MID$("FLASHING",loop+1,1)
820 MOVE 608-loop*32,L:PRINT MID$("COLOURS!",8-loop,1)
830 NEXT:C=C+1:IF C=14 THEN C=11
840 NEXT:PLOT -800,-800,2
850 FOR loop=0 TO 2000:NEXT
860 FOR loop=0 TO 320 STEP 4
870 MOVE -loop,16:PRINT "FLASHING";
880 MOVE loop+382,16:DRAW loop+382,2,0:PLOT -800,-800,2
890 MOVE loop+384,16:PRINT "COLOURS!";
900 NEXT
910 FOR loop=0 TO 1000:NEXT
920 GOTO 630

```

*Tape Subscribers please note that on this month's tape the above three listings appear as TRIANGLE, TRACKS and TRAIN with the latter two already merged as TRAINDEM.*

# Cribbage: Part 1

## - the card game

from Nick Herrick

Cribbage is an excellent card game, comprising equal skill and luck, for two players. If you are not familiar with it, "potted" rules are included in the program.

This version complies with the rules for six card cribbage published in the 'Penguin book of card games'. The skill is in selecting the 'box' and in the play. I have played cribbage for about thirty years and I can beat the 'expert' computer level about three times out of five. The computer does NOT cheat at all in this game.

### HOW THE PROGRAM WORKS

Each subroutine has an introductory REM line to explain its purpose. The program consists of arrays, loops, GOSUBS and GOTOS: inevitably it hops around a lot as there are many different possible orders of play that have to be catered for.

Arrays of less than 10 variables have not been specifically DIMensioned. As the program is 36k long variables have on occasion been reused with different meanings at different points of play.

Any variable beginning with c refers to computer's hand, with y to your (ie - player's) hand and with x to temporary cards and loops used for both hands.

|                  |                                                                                                                                                                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lines 60-230:    | Main program: Line REM's are self explanatory.                                                                                                                                                                                                                                                                                  |
| Lines 240-890:   | mostly user defined characters for Ace, King, Queen, Jack and 1/2 pips to give realistic cards.                                                                                                                                                                                                                                 |
| Lines 900-1130:  | Shuffles numbers 1 to 52 into random order in array: to ensure no number occurs more than once the loop variable z is inserted in a random position [subscript (d)]. The subroutine then defines each card individually. This whole subroutine takes 5-7 seconds, which I feel is a reasonable time to shuffle a pack of cards! |
| Lines 1140-1190: | Self explanatory.                                                                                                                                                                                                                                                                                                               |
| Lines 1200-1330: | Takes alternate cards from top of the pack (dealing to you first if it is                                                                                                                                                                                                                                                       |

|                  |                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lines 1340-1420: | "computers deal" or vice versa) and directs to subroutines for printing these cards to screen.                                                                                                                                                                                                                                                                        |
| Lines 1430-1560: | Prints numbers under each card (used in play to enter your choice of card). You choose 2 cards for your 'box or 'crib', these are inserted into memory and the remainder of the hand memorised into arrays (yhand(a) is a number, 1 to 13 corresponding to Ace to King yhand\$(a) is the card eg 3♦ and y\$(a) is the suit of the card.                               |
| Line 1570:       | computer only uses next section on play level 1 (beginner).                                                                                                                                                                                                                                                                                                           |
| Line 1580-1700:  | Random selection of computer box. Variables start with c, otherwise have same meaning.                                                                                                                                                                                                                                                                                |
| Lines 1710-1880: | (not use for level 1 play). All court cards are valued at 10 in temporary array, which is then bubble sorted. For level 3 (expert) Lines 1900-2260 are missed.                                                                                                                                                                                                        |
| Lines 1890-2250: | Fives weighting to various values and combinations of cards: the more useful to the hand, the higher the value of s for that card.                                                                                                                                                                                                                                    |
| Lines 2260-2450: | Selects cards with lowest s value and puts them in the box, the remainder of the hand is arrayed as previously.                                                                                                                                                                                                                                                       |
| Lines 2460-2570: | Deals the selected cards to each player. Subroutines print cards to screen.                                                                                                                                                                                                                                                                                           |
| Lines 2580-2750: | You or computer 'cut' the remaining pack, take top card off the lower portion and turn it up for use in later scoring. Scores 2 points to dealer if Jack turned up.                                                                                                                                                                                                   |
| Lines 2760-3300: | Level 3 computer box selection, as 1890-2250. This is based on my idea of the values of various hands. You may wish to alter these values after trying the game (I welcome suggestions). Logically this section should lie between 2450-2460, but I wrote this section late in developing the program and there was not enough gap here in the original line numbers! |
| Lines 3310-3990: | This is very complex and directs who plays next according to who played last                                                                                                                                                                                                                                                                                          |

and whether a player can go or not. GOSUBS from it to play subroutines, or 'turn cards over' on reaching count of 31 or nearest. There are more than 30 possible different orders of play so this complexity is inevitable.

Lines 400-4060: v defines number of cards played, v1 to v4 previous cards played and are used as subscripts for variable for last 4 cards played plus current one added at end of subroutine. (re uses xhnd and xhn arrays).

Line 4070: k is total score so far ("count"): if this <=21 you must be able to play.

Lines 4080-4140: Self explanatory.

Lines 4150-4280: Prints and deletes cards, works out your score (if any) from this play and adds the pip count to k. Variables v1 etc. are used to calculate runs in subroutine 5320.

Lines 4290-4350: As 400-4060.

Lines 4360-4400: Decides if computer can play.

Lines 4410-4500: Decides if computer has high score combination and then plays it: jumps to 4670 if card played.

Lines 4520-4590: As above for low score combination.

Line 4600: If one card only remains plays this.

Lines 4610-4710: Random selection of card for level 1, then handles score and count.

Lines 4720-4920: Selects 'best' non scoring card to play in similar manner to 'box' selection. Again you may wish to load this differently.

Lines 4390-5100: "Intermediate" subroutines directing to printing and deleting of correct cards on screen.

Lines 5110-5220: Prints top and bottom 2 lines of cards: the 'picture' on the card is printed in subroutine 7150.

Lines 5230-5290: Self explanatory.

Lines 5300-5520: This was the most difficult part of the program to get correct: as runs can be scored in ANY order of play of 3 or more cards, it had to select these, but not if another card was intermediate eg. if cards were played in this order 2,5,3,4 a run only results on play of 4th card. The subroutine bubble sorts, "gets rid of" one card in a pair then assesses if there is a run and validates it with a checksum.

Lines 5030-6080: Self explanatory.

Lines 6090-6150: Enables hands to be scored in correct order (if non dealer, who scores first, gets over 121 he wins, even if dealer has a better hand).

Lines 6160-6280: Transfers various hands and box to temporary array for scoring. Reuses xhnd and xhn arrays, rscore, q and k.

Lines 6390-7100: Prints out individual hands and 'lift

card', bubble sorts hands and runs through loops to calculate score for every possible combination, then delays long enough for you to check it. It works!

Lines 7110-7820: Prints each card in realistic manner: fits into middle of lines 5320-5540 (the card graphics were written after the program was running).

Lines 7830-end: Self explanatory. Data all LOCATE x&y coordinates of top left of cards in various positions.

*NOTE FROM THE EDITOR - I am a Cribbage fan and have played the game for more than 25 years now. I went straight to the "Expert" level and played Nick's version for well over an hour. He has covered all the important points well and it does provide a good game. Well done Nick!*

**In view of the length of this program, we have divided it into two parts - the final part will appear next month.**  
**Tape Subscribers will find the full version on their August tape.**

```

10 ' CRIBBAGE $ Nick Herrick 1986
20 ' The Amstrad User Jul/Aug 87
30 ' This program has been RENUMBERED for ease of enter
ing.
40 ' Therefore keep strictly to line numbers or it won
't work
50 '
60 ' ***** MAIN CONTROL LOOP *****
70 GOSUB 240 ' initialize
80 GOSUB 7830 ' title
90 GOSUB 8170 ' rules of crib
100 GOSUB 5940 ' instructions
110 GOSUB 1140 ' initial choice of deal
120 GOSUB 900 ' shuffle & deal
130 GOSUB 1340 ' number cards (deal)
140 GOSUB 1430 'your box and random computer box (level 1
)
150 IF level>1 THEN GOSUB 1710 ' calculated computer box
160 GOSUB 2460 ' Redeal hand for play
170 GOSUB 1340 ' number cards again (play)
180 GOSUB 2580 ' select and print lift
190 GOSUB 3310 ' play (GOSUBs from here for all play manovres)
200 IF cscore>=121 OR yscore>=121 THEN GOSUB 5760:GOTO 230
' for win during play
210 GOSUB 6090 'calculate hands & box
220 IF cscore>=121 OR yscore>=121 THEN GOSUB 5760 ' for win
in on hand/box score
230 RESTORE 8570:GOTO 120 ' repeats main loop

```

```

240 ' ***** INITIALIZE *****
250 MODE 1:BORDER 0:INK 0,0:INK 1,1:INK 2,6:INK 3,16:CLS
260 DIM cardno(52),card$(52),suit$(52),c1(52),c$(12),n(12)
270 club#=CHR$(226):diam#=CHR$(227):heart#=CHR$(228):spade#=#CHR$(229)
280 back#=STRING$(5,166)
290 WINDOW #1,1,40,20,25:PAPER#1,0:PEN#1,3
300 cscore=0:yscore=0
310 ywin=0:cwin=0
320 SYMBOL AFTER 129
330 SYMBOL 129,0,0,0,0,0,1,3,3
340 SYMBOL 130,24,24,60,126,255,255,255,255
350 SYMBOL 131,0,0,0,0,0,128,192,192
360 SYMBOL 132,7,7,7,7,3,0,0,0
370 SYMBOL 133,255,255,255,255,219,24,24,60
380 SYMBOL 134,224,224,224,224,192,0,0,0
390 st#=CHR$(129)+CHR$(130)+CHR$(131):sb#=CHR$(132)+CHR$(133)+CHR$(134)
400 SYMBOL 135,1,3,3,7,7,7,7,7
410 SYMBOL 136,195,231,255,255,255,255,255,255
420 SYMBOL 137,128,192,192,224,224,224,224,224
430 SYMBOL 138,3,3,1,0,0,0,0,0
440 SYMBOL 139,255,255,255,255,126,60,24
450 SYMBOL 140,192,192,128,0,0,0,0,0
460 ht#=CHR$(135)+CHR$(136)+CHR$(137):hb#=CHR$(138)+CHR$(139)+CHR$(140)
470 SYMBOL 141,0,0,0,0,0,0,1,3
480 SYMBOL 142,24,24,60,126,126,255,255,255
490 SYMBOL 143,0,0,0,0,0,0,128,192
500 SYMBOL 144,3,1,0,0,0,0,0,0
510 SYMBOL 145,255,255,255,126,126,60,24,24
520 SYMBOL 146,192,128,0,0,0,0,0,0
530 dt#=CHR$(141)+CHR$(142)+CHR$(143):db#=CHR$(144)+CHR$(145)+CHR$(146)
540 SYMBOL 147,0,0,0,0,0,0,3,7
550 SYMBOL 148,60,126,255,255,255,126,189,255
560 SYMBOL 149,0,0,0,0,0,0,192,224
570 SYMBOL 150,15,15,15,15,7,3,0,0
580 SYMBOL 151,255,255,255,255,219,153,24,60
590 SYMBOL 152,240,240,240,240,224,192,0,0
600 ct#=CHR$(147)+CHR$(148)+CHR$(149):cb#=CHR$(150)+CHR$(151)+CHR$(152)
610 SYMBOL 153,27,27,0,15,5,5,5,5
620 SYMBOL 154,90,90,66,255,72,72,72,72
630 SYMBOL 155,216,216,16,240,16,16,200,16
640 SYMBOL 156,5,5,2,5,5,5,5,10
650 SYMBOL 157,72,72,164,80,80,80,80,163
660 SYMBOL 158,8,8,8,12,16,112,16,224
670 jt#=CHR$(153)+CHR$(154)+CHR$(155):jb#=CHR$(156)+CHR$(157)+CHR$(158)
680 SYMBOL 159,1,1,1,1,2,4,4,8
690 SYMBOL 160,255,239,143,7,3,153,65,65
700 SYMBOL 161,16,136,164,210,218,232,232,224
710 SYMBOL 162,8,8,28,28,28,62,63,127
720 SYMBOL 163,97,3,231,15,31,63,127,255
730 SYMBOL 165,240,248,120,188,156,208,230,143
740 qt#=CHR$(159)+CHR$(160)+CHR$(161):qb#=CHR$(162)+CHR$(163)+CHR$(165)
750 SYMBOL 166,29,16,10,15,16,22,16,16
760 SYMBOL 167,231,66,231,255,2,50,130,130
770 SYMBOL 168,104,8,80,240,168,168,168,168
780 SYMBOL 169,16,16,40,9,16,16,18,10
790 SYMBOL 170,130,194,2,226,2,2,169,168
800 SYMBOL 171,168,168,168,168,168,168,84,0
810 kt#=CHR$(166)+CHR$(167)+CHR$(168):kb#=CHR$(169)+CHR$(170)+CHR$(171)
820 SYMBOL 172,0,0,0,0,16,56,124,254
830 SYMBOL 173,254,16,56,0,0,0,0,0
840 SYMBOL 174,0,0,0,0,108,254,254,254
850 SYMBOL 175,124,56,16,0,0,0,0,0
860 SYMBOL 176,0,0,0,0,56,56,254,254
870 SYMBOL 177,254,16,56,0,0,0,0,0
880 spt#=CHR$(172):ddt#=CHR$(172):spb#=CHR$(173):htt#=CHR$(174):htb#=CHR$(175):ddb#=CHR$(175):clt#=CHR$(176):clb#=CHR$(177)
890 RETURN
900 ' ***** SHUFFLE *****
910 FOR z=1 TO 52:cardno(z)=0:NEXT z
920 BORDER 16:PAPER 3:PEN 1
930 CLS:LOCATE 6,10:PRINT "Please wait: shuffling..."
940 RANDOMIZE TIME
950 FOR z=1 TO 52
960 d=INT(RND*52+1)
970 IF cardno(d)<>0 THEN 960
980 cardno(d)=z
990 NEXT z
1000 FOR z=1 TO 52
1010 IF cardno(z)<=13 THEN suit$(z)=spade#
1020 IF cardno(z)<=26 AND cardno(z)>13 THEN suit$(z)=heart#
1030 IF cardno(z)<=39 AND cardno(z)>26 THEN suit$(z)=diam#
1040 IF cardno(z)>=40 THEN suit$(z)=club#
1050 c1(z)=cardno(z)
1060 WHILE c1(z)>13
1070 c1(z)=c1(z)-13
1080 WEND
1090 IF c1(z)=1 THEN cd#=" A" ELSE IF c1(z)=11 THEN cd#=" J" ELSE IF c1(z)=12 THEN cd#=" Q" ELSE IF c1(z)=13 THEN cd#=" K" ELSE cd#=STR$(c1(z))
1100 card$(z)=cd#+ " "+suit$(z)
1110 NEXT z
1120 GOSUB 1200
1130 RETURN
1140 ' **** INITIAL CHOICE OF DEAL ****
1150 BORDER 16:PAPER 3:PEN 1:CLS
1160 LOCATE 7,12:PRINT "Do you wish to deal? (Y/N)

```

```

1170 i$=UPPER$(INKEY$):IF i$<>"N" AND i$<>"Y" THEN 1170
1180 IF i$="N" THEN deal=0 ELSE deal=1
1190 RETURN
1200 ' ***** DEAL *****
1210 BORDER 0:PAPER 0
1220 CLS:PAPER 3
1230 FOR z=1+deal TO 11+deal STEP 2
1240 c$(z)=card$(z):n(z)=c1(z):h$=suit$(z)
1250 IF suit$(z)=heart$ OR suit$(z)=diam$ THEN p=2 ELSE p
=0
1260 READ x,y
1270 IF deal=0 THEN GOSUB 5110 ELSE GOSUB 5230
1280 READ x,y
1290 IF deal=0 THEN GOSUB 5230 ELSE GOSUB 5110
1300 NEXT z
1310 box=deal:num=6
1320 IF deal=1 THEN deal=0 ELSE deal=1
1330 RETURN
1340 ' ***** NUMBER *****
1350 x=2:y=9:y1=18
1360 PAPER 0:PEN 3
1370 FOR z=1 TO num
1380 LOCATE x,y:PRINT STR$(z)
1390 LOCATE x,y1:PRINT STR$(z)
1400 x=x+6
1410 NEXT z
1420 RETURN
1430 ' ***** YOUR BOX *****
1440 IF box=1 THEN PRINT #1,"Your box" ELSE PRINT #1, "My
box"
1450 INPUT #1,"Please enter, by number and separated by
a comma, your two cards for the box. ",yb1,yb2
1460 IF yb1=yb2 THEN PRINT #1,"You can't have the same ca
rd twice!":GOTO 1450
1470 IF yb1<1 OR yb1>6 OR yb2<1 OR yb2>6 THEN PRINT #1,"Y
ou've made a mistake: try again":GOTO 1450
1480 IF box=1 THEN yb1=yb1*2:yb2=yb2*2
1490 IF box=0 THEN yb1=yb1*2-1:yb2=yb2*2-1
1500 a=1
1510 FOR z=box+1 TO box+11 STEP 2
1520 IF z=yb1 OR z=yb2 THEN 1550
1530 yhnd(a)=c1(z):yhand$(a)=card$(z):ys$(a)=suit$(z)
1540 a=a+1
1550 NEXT z
1560 ybx1=c1(yb1):ybx2=c1(yb2):ybox1$=card$(yb1):ybox2$=c
ard$(yb2):ys1$=suit$(yb1):ys2$=suit$(yb2)
1570 IF level>1 THEN RETURN
1580 ' ***** RANDOM COMPUTER BOX *****
1590 cb1=INT(RND*6+1):cb2=INT(RND*6+1)
1600 IF cb1=cb2 THEN cb2=cb2+1:IF cb2=7 THEN cb2=1
1610 IF box=1 THEN cb1=cb1*2-1:cb2=cb2*2-1
1620 IF box=0 THEN cb1=cb1*2:cb2=cb2*2
1630 a=1
1640 FOR z=2-box TO 12-box STEP 2

```

```

1650 IF z=cb1 OR z=cb2 THEN 1660
1660 chnd(a)=c1(z):chand$(a)=card$(z):cs$(a)=suit$(z)
1670 a=a+1
1680 NEXT z
1690 cbx1=c1(cb1):cbx1$=card$(cb1):cbx2=c1(cb2):cbx2$=c
ard$(cb2):cs1$=suit$(cb1):cs2$=suit$(cb2)
1700 RETURN
1710 ' ***** COMPUTER BOX *****
1720 CLS #1:IF box=0 THEN PRINT #1,"Please wait: I'm choo
sing cards for my box." ELSE PRINT #1,"Please wait: I'm
selecting my rejects for your box."
1730 a=1
1740 FOR z=2-box TO 12-box STEP 2
1750 xhnd(a)=c1(z):xhand$(a)=card$(z):xs$(a)=suit$(z)
1760 IF xhnd(a)=11 OR xhnd(a)=12 OR xhnd(a)=13 THEN xhn(a
)=10 ELSE xhn(a)=xhnd(a)
1770 a=a+1
1780 NEXT z
1790 FOR z=1 TO 6:s(z)=0:NEXT z
1800 FOR z=1 TO 5
1810 FOR a=z+1 TO 6
1820 IF xhnd(a)>xhnd(z) THEN 1860
1830 t=xhnd(a):t1=xhn(a):t2$=xhand$(a):t3$=xs$(a)
1840 xhnd(a)=xhnd(z):xhn(a)=xhn(z):xhand$(a)=xhand$(z):xs
$(a)=xs$(z)
1850 xhnd(z)=t:xhn(z)=t1:xhand$(z)=t2$:xs$(z)=t3$
1860 NEXT a
1870 NEXT z
1880 IF level=3 THEN 2760
1890 FOR z=1 TO 6
1900 IF xhn(z)=5 THEN s(z)=s(z)+1
1910 IF box=1 AND xhn(z)=5 THEN s(z)=s(z)+2
1920 NEXT z
1930 FOR z=1 TO 3
1940 FOR a=z+1 TO 4
1950 FOR t=a+1 TO 5
1960 FOR z1=t+1 TO 6
1970 IF xhn(z)+xhn(a)+xhn(t)+xhn(z1)=15 THEN s(z)=s(z)+1:
s(a)=s(a)+1:s(t)=s(t)+1:s(z1)=s(z1)+1
1980 NEXT z1
1990 NEXT t
2000 NEXT a
2010 NEXT z
2020 FOR z=1 TO 4
2030 FOR a=z+1 TO 5
2040 FOR t=a+1 TO 6
2050 IF xhn(z)+xhn(a)+xhn(t)=15 THEN s(z)=s(z)+1:s(a)=s(a
)+1:s(t)=s(t)+1
2060 NEXT t
2070 NEXT a
2080 NEXT z
2090 FOR z=1 TO 5
2100 FOR a=z+1 TO 6
2110 IF xhn(z)+xhn(a)=15 THEN s(z)=s(z)+1:s(a)=s(a)+1

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2120 NEXT a
2130 NEXT z
2140 FOR z=1 TO 4
2150 FOR a=z+1 TO 5
2160 FOR t=a+1 TO 6
2170 IF xhnd(z)=xhnd(a)-1 AND xhnd(z)=xhnd(t)-2 THEN s(z)
=s(z)+1:s(a)=s(a)+1:s(t)=s(t)+1
2180 NEXT t
2190 NEXT a
2200 NEXT z
2210 FOR z=1 TO 5
2220 FOR t=z+1 TO 6
2230 IF xhnd(z)=xhnd(t) THEN s(z)=s(z)+1:s(t)=s(t)+1
2240 NEXT t
2250 NEXT z
2260 cb1=0:cb2=0:z=0:a=0
2270 WHILE cb2=0
2280 FOR t=1 TO 6
2290 IF s(t)=z THEN a=t
2300 IF cb1=0 THEN cb1=a ELSE cb2=a
2310 IF cb2=cb1 THEN cb2=0
2320 NEXT t
2330 IF cb2>0 THEN 2350
2340 z=z+1
2350 WEND
2360 IF box=1 AND level=3 AND xhn(cb1)+xhn(cb2)=15 THEN s
(cb1)=s(cb1)+1:s(cb2)=s(cb2)+1:GOTO 2260
2370 IF box=1 AND level=3 AND xhnd(cb1)=xhnd(cb2) THEN s(
cb1)=s(cb1)+1:s(cb2)=s(cb2)+1:GOTO 2260
2380 a=1
2390 FOR z=1 TO 6
2400 IF z=cb1 OR z=cb2 THEN 2430
2410 chnd(a)=xhnd(z):cs$(a)=xs$(z):chand$(a)=xhand$(z)
2420 a=a+1
2430 NEXT z
2440 cbx1=xhnd(cb1):cbox1$=xhand$(cb1):cs1$=xs$(cb1):cbx2
=xhnd(cb2):cbox2$=xhand$(cb2):cs2$=xs$(cb2)
2450 RETURN
2460 ' ***** DEAL PLAYING HANDS *****
2470 CLS:PAPER 3
2480 FOR z=1 TO 4
2490 IF ys$(z)=heart$ OR ys$(z)=diam$ THEN p=2 ELSE p=0
2500 c$(z)=yhand$(z):n(z)=yhnd(z):h$=ys$(z)
2510 READ x,y
2520 IF box=0 THEN GOSUB 5110 ELSE GOSUB 5230
2530 READ x,y
2540 IF box=0 THEN GOSUB 5230 ELSE GOSUB 5110
2550 NEXT z
2560 num=4
2570 RETURN
2580 ' ***** LIFT *****
2590 IF box=1 THEN 2660
2600 x=36:y=5:PAPER 3
2610 GOSUB 5230
2620 PRINT #1,"Your lift up of pack to select card for sc
oring."
2630 INPUT #1,"Choose a number (1 to 39)",ch
2640 IF ch<1 OR ch>39 THEN PRINT #1,"Wrong choice.":GOTO
2630
2650 ch=ch+12:GOTO 2680
2660 PRINT #1,"My lift."
2670 ch=INT(RND*39+1)+12
2680 lift$=card$(ch+1):lft=c1(ch+1):ls$=suit$(ch+1):h$=su
it$(ch+1)
2690 IF ls$=heart$ OR ls$=diam$ THEN p=2 ELSE p=0
2700 z=1:c$(z)=lift$:n(z)=lft
2710 PAPER 3:x=36:y=5
2720 GOSUB 5110
2730 IF lft=11 AND box=1 THEN yscore=yscore+2
2740 IF lft=11 AND box=0 THEN cscore=cscore+2
2750 RETURN
2760 ' ***** EXPERT COMPUTER BOX *****
2770 FOR z=1 TO 6
2780 IF xhnd(z)=1 OR xhnd(z)=5 OR xhnd(z)=11 THEN s(z)=s(
z)+1
2790 IF box=1 AND xhnd(z)=5 THEN s(z)=s(z)+6
2800 NEXT z
2810 FOR z=1 TO 3
2820 FOR a=z+1 TO 4
2830 FOR t=a+1 TO 5
2840 FOR z1=t+1 TO 6
2850 IF xhn(z)+xhn(a)+xhn(t)+xhn(z1)=15 THEN s(z)=s(z)+2:
s(a)=s(a)+2:s(t)=s(t)+2:s(z1)=s(z1)+2
2860 NEXT z1
2870 NEXT t
2880 NEXT a
2890 NEXT z
2900 FOR z=1 TO 4
2910 FOR a=z+1 TO 5
2920 FOR t=a+1 TO 6
2930 IF xhn(z)+xhn(a)+xhn(t)=15 THEN s(z)=s(z)+3:s(a)=s(a
)+3:s(t)=s(t)+3
2940 NEXT t
2950 NEXT a
2960 NEXT z
2970 FOR z=1 TO 5
2980 FOR a=z+1 TO 6
2990 IF box=1 AND xhn(z)+xhn(a)=15 THEN s(z)=s(z)+5:s(a)=
s(a)+5
3000 IF box=0 AND xhn(z)+xhn(a)=15 THEN s(z)=s(z)+3:s(a)=
s(a)+3
3010 NEXT a
3020 NEXT z
3030 FOR z=1 TO 4
3040 FOR a=z+1 TO 5
3050 FOR t=a+1 TO 6
3060 IF xhnd(z)=xhnd(a)-1 AND xhnd(z)=xhnd(t)-2 THEN s(z)
=s(z)+6:s(a)=s(a)+5:s(t)=s(t)+6

```



```

3070 NEXT t
3080 NEXT a
3090 NEXT z
3100 FOR z=1 TO 3
3110 FOR a=z+1 TO 4
3120 FOR t=a+1 TO 5
3130 FOR z1=t+1 TO 6
3140 IF xhnd(z)=xhnd(a)-1 AND xhnd(z)=xhnd(t)-2 AND xhnd(
z)=xhnd(z1)-3 THEN s(z)=s(z)+3:s(a)=s(a)+3:s(t)=s(t)+3:s(
z1)=s(z1)+3
3150 NEXT z1
3160 NEXT t
3170 NEXT a
3180 NEXT z
3190 FOR z=1 TO 5
3200 FOR a=z+1 TO 6
3210 IF xhnd(z)=xhnd(a)-1 THEN s(z)=s(z)+1:s(a)=s(a)+1
3220 NEXT a
3230 NEXT z
3240 FOR z=1 TO 5
3250 FOR a=z+1 TO 6
3260 IF box=1 AND xhnd(z)=xhnd(a) THEN s(z)=s(z)+5:s(a)=s
(a)+5
3270 IF box=0 AND xhnd(z)=xhnd(a) THEN s(z)=s(z)+3:s(a)=s
(a)+3
3280 NEXT a
3290 NEXT z
3300 GOTO 2260
3310 ' ***** MAIN PLAY LOOP *****
3320 IF cscore>=121 OR yscore>=121 THEN CLS #1:GOSUB 5670
:FOR t=1 TO 999:NEXT t:RETURN
3330 k=0:cplay=0:yplay=0:f1=0:f2=0:f3=0:f4=0:g1=0:g2=0:g3
=0:g4=0:ff=0:gg=0:v=0
3340 FOR z=1 TO 4
3350 IF chnd(z)=11 OR chnd(z)=12 OR chnd(z)=13 THEN chn(z
)=10 ELSE chn(z)=chnd(z)
3360 IF yhnd(z)=11 OR yhnd(z)=12 OR yhnd(z)=13 THEN yhn(z
)=10 ELSE yhn(z)=yhnd(z)
3370 NEXT z
3380 FOR z=0 TO 8:xhnd(z)=0:NEXT z
3390 GOSUB 5650:FOR t=1 TO 999:NEXT t
3400 IF box=0 THEN GOSUB 4000 ELSE GOSUB 4290
3410 IF yscore>=121 OR cscore>=121 THEN RETURN
3420 IF k=0 THEN 3520
3430 IF box=1 THEN GOSUB 4000 ELSE GOSUB 4290
3440 IF yscore>=121 OR cscore>=121 THEN RETURN
3450 IF g4>0 AND f4>0 THEN 3950
3460 IF cplay=0 AND yplay=0 THEN 3400
3470 IF cplay>0 AND yplay=0 THEN GOSUB 4000:GOTO 3470
3480 IF yscore>=121 OR cscore>=121 THEN RETURN
3490 IF cplay=0 AND yplay>0 THEN GOSUB 4290:GOTO 3490
3500 IF yscore>=121 OR cscore>=121 THEN RETURN
3510 IF f4>0 AND g4>0 THEN 3950
3520 IF cplay>1 THEN cplay=1

```

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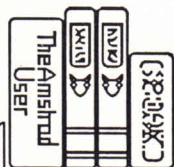
3530 IF yplay>1 THEN yplay=1
3540 GOSUB 5070
3550 IF k>0 AND q=0 THEN yscore=yscore+1
3560 IF k>0 AND q=1 THEN cscore=cscore+1
3570 k=0:GOSUB 5650:FOR t=1 TO 999:NEXT t
3580 v=0
3590 FOR z=0 TO 8:xhnd(z)=0:NEXT z
3600 IF g4>0 THEN q=1
3610 IF f4>0 THEN q=0
3620 IF q=1 THEN GOSUB 4290 ELSE GOSUB 4000
3630 IF yscore>=121 OR cscore>=121 THEN RETURN
3640 IF f4>0 AND g4>0 THEN 3950
3650 IF q=0 THEN GOSUB 4290 ELSE GOSUB 4000
3660 IF yscore>=121 OR cscore>=121 THEN RETURN
3670 IF f4>0 AND g4>0 THEN 3950
3680 IF k=0 THEN 3760
3690 IF cplay=1 AND yplay=1 THEN 3650
3700 IF cplay>1 AND yplay=1 THEN GOSUB 4000:GOTO 3700
3710 IF yscore>=121 OR cscore>=121 THEN RETURN
3720 IF f4>0 AND g4>0 THEN 3950
3730 IF yplay>1 AND cplay=1 THEN GOSUB 4290:GOTO 3730
3740 IF yscore>=121 OR cscore>=121 THEN RETURN
3750 IF f4>0 AND g4>0 THEN 3950
3760 IF cplay>1 AND yplay>1 THEN GOSUB 5070
3770 IF k>0 AND q=0 THEN yscore=yscore+1
3780 IF k>0 AND q=1 THEN cscore=cscore+1
3790 k=0:GOSUB 5650:FOR t=1 TO 999:NEXT t
3800 v=0
3810 FOR z=0 TO 8:xhnd(z)=0:NEXT z
3820 IF f4>0 THEN GOSUB 4000
3830 IF yscore>=121 OR cscore>=121 THEN RETURN
3840 IF f4>0 AND g4>0 THEN 3950
3850 IF f4>0 THEN 3820
3860 IF g4>0 THEN GOSUB 4290
3870 IF yscore>=121 OR cscore>=121 THEN RETURN
3880 IF f4>0 AND g4>0 THEN 3950
3890 IF g4>0 THEN 3860
3900 IF q=0 THEN GOSUB 4000 ELSE GOSUB 4290
3910 IF yscore>=121 OR cscore>=121 THEN RETURN
3920 IF f4>0 AND g4>0 THEN 3950
3930 IF q=1 THEN GOSUB 4000 ELSE GOSUB 4290
3940 IF yscore>=121 OR cscore>=121 THEN RETURN
3950 IF k=0 THEN RETURN
3960 IF q=0 THEN yscore=yscore+1
3970 IF q=1 THEN cscore=cscore+1
3980 GOSUB 5650:FOR t=1 TO 999:NEXT t
3990 RETURN
4000 ' ***** YOUR PLAY *****
4010 IF g4>0 THEN q=0:yplay=yplay+1:RETURN
4020 v=v+1
4030 v1=v-1:v2=v-2:v3=v-3:v4=v-4
4040 IF v=1 THEN v2=0:v3=0:v4=0
4050 IF v=2 THEN v3=0:v4=0
4060 IF v=3 THEN v4=0

```

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