

DRAGON

USER



The independent Dragon magazine

September 1987

Contents

Letters

Dragon's music library ... tip for Beyerbeard ... what about hardware projects? ... user club ... more machine code please ... more flying eggs.

News Desk

A couple of corrections ... some corrections ... and some corrections. The latest Dragon Update, and a new range of printer stands at reasonable prices.

Dragonsoft

Magister by Pulsar Software ... Data Retrieval System by Grosvenor Software

Datasort

Mike Hosken has raised the spaghetti tree to devise a database which will sort nearly anything.

Mountain building

Anthony Gannals takes to the hills with a program to construct your favourite syndicates and empires.

Dragon Answers

Brian Cudge gets to grips with converting Tandy travelcard code ... is it possible to canonicalise an Amstrad printer? ... looking through many Windows ... and two obit: List Double and On Error Run.

Winners and losers

Gordon Lee looks at some of the solutions to the April competition and tackles the touchy subject of "E" numbers — are they bad for your health?

Down in the dumps

Another selection from our stack of printer screen dumps. This month: the Epson FX-85, the Tandy Color Graphic Printer and the Tandy CSP-85.

Write: ADVENTURE

Not content with telling the player where to go and what to do, now you put the descriptive prose in too, the humour, the verve.

Adventure trail

Pete Gerard in search of Universe 2 — small wonder he can't find it, because he's in Aquanaut 877 finding the solution.

Competition

"Two requests between 4pm and 4pm" said the Red Queen. "Do what?" said Alice. Who will unravel these primitive roots? And win a copy of *Mosers Dream* by Microvision?

The Answer

Gordon Lee's personal solution to the June competition — winners are announced as usual, and many thanks to MICROSOFT who came galloping out of the sunset with the mystery prize.

Editorial

WELL, I was wrong about Wales. It rained in the morning and in the afternoon. And all night as well. And every day the hoards of walkers and cyclists dripped into our village in search of a pint of anything but water. Such is the indomitable spirit that Wales inspires.

It's early in the month here and the Special Offerbooks are selling fast, but because I am an optimist (or is it pessimist?) I am running the coupons again so that anyone who wants extra copies, to pass on the page to a friend, or didn't want to hack up last month's classified page gets another chance. If all goes well we may be able to arrange something else along the same lines.

I see Paul Gade has been laying into users who tape copies of WUOD software. Guilt right too. Duplicating other people's products to sell a couple of quid here and there is bad news. Flipping off anyone's software is bad news these days. You might say 'well, I wouldn't buy it anyway' but I sat back example, and Dragon suppliers, who are playing the small market, need your support.

Think twice, take my advice. You could be cutting your own network from under you.

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How to submit articles

The quality of the material we can publish in *Dragon User* each month will, to a very great extent, depend on the quality of the disclosures that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to *Dragon User* for publication should not be more than 2000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, or if possible keep a copy of programs which may be useful. Programs returned will include a definite acknowledgment of receipt.

Letters

Adventure extra

I would like to wish Peter Gierard good luck in his takeover of the Adventure column and hope that I can become as good a friend to him as I was to his brother Mike. May his light never go out.

A little tip for those stuck in Tanglewood: drink in western will house the springboard.

Simon 'The Scler' Hargrave
Crawley Hill Farm

Cliff
Dumley
Gloucester GL1 1 5BH

At the last crawl Mike's light was still glowing gently over his old column, because the signmen have been round to fix it. But we're having it sent along to the Guardian as soon as possible.

Machine code please

EVERY month I enjoy reading your brilliant magazine, but I think that something is still to come.

Twelve things I'm looking for every month in machine code for the more advanced user. I think I know that all we Dragon users have had the computer for a while and know something about machine code, and I don't think we are interested in Basic for the beginner.

When I say machine code, I mean machine code that includes machine code in conjunction with the disc too (FX, How to load and save from MC). I must say that even the Basic programs printed over the years are of a very high quality.

I would also like to read more about hardware projects. For example, I'm right now building a battery-backup real-time-clock and a RS232C interface into my Dragon 32. I have built a PIA/tech security rush when I communicate with other computers. I would like to tell you more about the projects if you would like it.

Jacob Hoffman
2 Eileenobolam
8800 Hilary
Dumley

Every month we will be shelling out a game or two, courtesy of Microdeal, to the readers who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your best Dragon stories. What if you think we are, mind readers?!

EXTRA
PUFF

Music for the Millions

SOME time ago I wrote a letter of thanks to all the Dragon users who responded to a request for help with 'Puff', our tune Dragon at Westgate, a short-play tune for children with a mental handicap. The response was overwhelming, and several people have kept in touch with us and provide continuing help and advice. I acquired a Dragon 64 for my own use in creating programs for the children, along with Microdeal's Composer utility which, as an ex-professional musician, I found invaluable for producing 'proper' music on the Dragon. It does, however require some musical knowledge to produce the best results, particularly when moving graphics-note by note. Unless the notes are all the same length, a very jerky effect can result, as well as making the tune sound rather odd with the pulses as the graphics are moved.

By way of thanks to the Dragon users, I am developing a library of Composer tunes, both Basic DATA statements and MC files so that programs with little musical knowledge can have access to a ready-made source of variety of music, from short 'ingles' and wined tunes compatible with moving graphics, to full-length classical pieces just for listening to, nursery rhymes, Christmas carols and TV themes, etc. The Basic DATA lines are commented with MC files to enable bits of music to be dropped into or recalled, and I have a short utility to automatically insert 'return to Basic' between snippets of a MC file and the results.

Unfortunately it is not complete as yet. I am aiming for 100 tunes as a starting point with just over 80 completed so far. Unfortunately I will not have the time actually to anthologise when completed, so if someone out there is willing to take it on, then please get in touch. I must stress though that it is intended as a free service to Dragon users and not a commercial proposition (barter is exempted). Sorry, forgot to mention, not having a disc-drive, the library is cassette based with four tapes available (C1 to C4).

Anyone interested in taking the library, or helping to set it up, please give me a call or drop me a line at home or work.

Start Download
I Mind Bottom
Hub Lane
Roxford
Sawbury Bridge
W. Yorkshire WF8 3DL

PS I haven't a disc-drive, I don't need a printer, I can only program in Basic and don't play adventure games. The new Dragon 64 users mentioned in July's editorial could well be put off by thinking that DJ is only catering for advanced users and leaving behind the beginners like me!

EVERY single issue we have at least one person saying there was nothing interesting in it and why don't we run the same things over in the issue before that — anyone persnickitating it was the most interesting issue he's seen for ages. Please everyone? Of course we do — we just can't do it every month, that's all. I think Stuart's library ideas is going to prove quite a few people, though. Thanks from Designers for your efforts, and the efforts of the people who are supporting the effort.

We are not certain quite when, but another series on machine code is planned in the future.

We would actually like to run more hardware projects, but we can only in fairness consider small projects, as the potential for getting into trouble on an ambitious modification is almost limitless; this kind of thing is best left to specialist hardware magazines. Anybody who wants to send us a hardware project for consideration: please send a detailed description of what the device does, a COMPLETE set of drawings, including any PCB layout involved, and a complete list of parts used, along with the names and addresses of current suppliers, and cost.

Then we can think about publishing!

Club information

THANK you very much for publishing the fact that I am involved in forming a new user group. However the exact details you published were not correct. I feel that this was my fault as my initial letter was somewhat ambiguous. I would then be thankful if you would publish the new details.

- 1) My postcode is not HP4 5LH (the postman was mistaken).
- 2) The group is not only a local one but a postal group with newsletter, etc. I will however be more than glad to arrange meetings in my area.
- 3) The first newsletter is almost ready (I will send you a copy).
- 4) Copies for prospective members can be obtained via me for a charge 50p.
- 5) Subscription is 24 letters or 27 40p ones.
- 6) Members will have to be involved in the group.

I am very grateful for your help.

A. Bell, 75 Sainsbury Rd
Aylesford, Kent ME4 5LR

HAVE Don't mention post people around here just at the moment. The post and posties are on strike again, and if there's anything essential missing from SD this month, that's why.

Machine code wanted for beginners

I have owned a Dragon 32 for one and a bit years now and have been an avid reader of your magazine for the same period (since Feb 1984).

I have read one or two letters from other readers asking for the articles to the less (paid) experts (guilt) and in one case the pleasant "less morose".

May I plead the opposite case. Although I am of mature years, I have a competing age of probably five. I am slow by starting to understand Basic and take even modify one or two printed programs to be sure that they still work. BUT Machine code gives me a headache.

Would it be possible for someone to write an explanation in juvenile terms (computer-wise) so that I, and others like me, can at least enter Micromanics via an assembler and get something out.

I have a complete set of "M.P.U.T." magazines, latest edition and have taped their Dragon assembler. I also have CO-HEX from Microdeal. All I ever get is error messages. Even these flash across the screen too fast for comprehension. My hair was grey when I started but I shall quit pulling it out quite soon.

If your staff authors consider themselves to be maybe one the readers who are regular correspondents could take up the challenge. I have two books by John Kinder Ryden beside me now, and they don't help either. PLEASE, what am I doing wrong?

R.J. Harding
27 Dorset Avenue
Cirencester
Glos. GL7 3QS

Staff author? STAFF AUTHOR? In this business, we think a staff author is someone who writes for *Ward's Weekly*... I wish we had one or two. At least then I would know where they were when I wanted them.

Seriously, is anyone reading this interested in taking up the challenge? If so, drop the editor a line.

Hi Score Corner

ACCORDING to our posting, Chuckie Egg is one of the most popular games of all time. Why then do our readers spend hundreds of hours playing it? Paul Leskiewicz's challenge in *DD June* called for the cream of the crop.

WHILE reading your Hi-Score Corner, I came across Paul Leskiewicz's high score for Chuckie Egg, which was 222,570 on level 22. My sister got on level 22 as well but got a higher score of 226,580. She pleads for this letter to be printed. Please let me know if anyone should beat this as my sister wishes to challenge them.

Melissa McCullough
126 Craggish Road
Belair
N Ireland
BT6 6LA

THIS woman will go far. Not only has she talent, but she has a manager as well. Enter the persons to adage, Dragon User lists up the victims.

REPLYING to Paul Leskiewicz in *June's* issue, the highest score I have ever got is 226,080 on level 21.

Simon Dismore
3 Sandingham Road
Kings Sutton
Banbury
Oxon
OX17 3QS

SHORT and to the point. Dave Bebbington goes for philosophy as well.

In response to Johnathan Baker's letter in the January issue, his high score on Chuckie Egg is not the highest. I have scored over 240,000 before level 20.

Unfortunately, this problem with high-scores is that there's usually someone else who has managed to better your score. I imagine that scores between 240,000 and 480,000 on Chuckie Egg would be quite hard to achieve, or is there somebody who can prove me wrong?

Dave Bebbington
50 Quarry Clough
Stalybridge
Cheshire SK15 2PW

THE problem with high scores? I thought that was the whole point of high scores ... but see below.

REPLYING to the June issue Hi-Score Corner, I scored 250,010 on Chuckie Egg (level 24) and that was nearly three years ago! I would like to ask some questions that have been bothering me.

1) There aren't any proper instructions in *Ward's Quick*. What do I do?

2) Whatever happened to a proposed game by Roy Coates called *Tastemart*?

3) Are there any good programs for light pens?

4) I can't get anywhere in *Return of the Ring* (can't find breather mask, etc.) (help)

Graham Kincaid
11 Garick Road
Northcote
Chester
CH1 4J

1) Write to the reader, or Pete Gerrard, or both. 2) Because Roy's programmer suddenly realised he was starving and went and got a proper job. 3) See last month's news page 4) someone help this chap. By the way, we are trying to sort out your missing tape query. Mr. Bruce, if at first you don't succeed, keep on swinging, as the spider said. But on to the next letters.

I WAS reading *June's* Hi-Score Corner and I found a score on Chuckie Egg that was 222,570 on level 22. My highest score was 261,680 on level 25.

Robert Hough
284 Mynage Lane
Merton
Stockpool
Lancs
L19 4ND

WHILE reading *June's* issue, I came across a letter from Paul Leskiewicz who said his hi-score for Chuckie Egg was 222,570. My hi-score for Chuckie Egg is 226,080, level 21.

Some other hi-scores:
Module Man 754,852
Hungry Harrier 9,794,329
Mr. Dig 3,428,280

If anyone needs help on *Exatone*, *Jurassic* or

Shenigans, please write to me. I also would be very glad if anyone could help me with the *Vortex Factor* (from year 2022/24C).

John Kossell
The Dragon Devil
2024 Padden
Romey

SEE, GENE? And further ...

PLEASE find enclosed my cheque for £14, and my payment slip. Keep up the good work.

Gail Thwait
11 Maydon Road
Rushden
Northants NN10 3RX

PS My high score for Chuckie Egg is 415,540 at level 22. The normal ducks go much faster and there are no bad ducks. If anyone can do level 22, then they easily know where that level is. My other good high-scores are 216,800 on *Donkey King*, 625,480 on *Mr Dig*, 454,800 on *Module Man* and 1,225,028 on *Hungry Harrier*. (None of them PCRE scored.)

NOW that's the kind of letter we really like. Where can we go from there? Time for another poem, obviously.

I thought I would write and tell you the game we love, *Moon Cresta*, is very good. The highest score is 26,000. I'm afraid I can only reach 23,800. As part of frustration I wrote a poem about it.

MOONCRESTA what a game
Score 26,000 and you reach
home.

It's good fun yet frustrating,
I guess it's all the writing.

What makes the game so
rewarding

Is, without any warning
FAR OUT, FAR OUT
What satisfaction.

It causes an adrenaline

reaction.

Moon Cresta is my game
Because in the end I

Type in my name.
Moon Cresta

Ms. V. Denton
729 Bentley Court
Moon Street
Luton
Bed. LU1 1ET

FAME at last, and she didn't even have to play Chuckie Egg to do it.

Trojan Heroes

DRAGON USER wishes to apologise to Trojan Micro Computer Software and Accessories for describing the original Trojan Light Pen software as 'disappointing' in the August issue.

This was entirely due to a misunderstanding about Trojan's reasons for permitting the software to be updated. Says Trojan's Tom Jones, who was extremely good natured about our blunder: "The Trojan lightpen software has sold over 50,000 copies overall, and was very well reviewed in Dragon User. We're still very happy with it. We have given informal permission for alterations to be made to it, within our copyright, as long as it is checked by us."

Trojan can be contacted on 0792 205-494 if anyone has any questions.

Good show

HERE are a couple of corrections to recent news items:

The Month of England/Dragon Show and Convention will be taking place as and where we said it would, with the exception that the venue is the **Bishop Henshaw Upper School**, Rochdale, and not the Bishop Henshaw Upper School as we claimed.

Sorry, Vicar!

"Do tell people to come along" says Puber's Brian O'Connor. "Some dealers will give up shows if they can't get a reasonable attendance and cover their costs. This will be a bit different from the average Dragon show."

It's your show. Go, go, go, life, life.

Also apologies to Hans Christian Andersen Software (of course their program Superwriter II can't be 'loaded into memory and then saved and loaded onto another disc' as we claimed in the July Newdesk. What we meant was that the data files can be saved to other discs).

Sorry, Hans!

NDUG

HERE I am, clutching a June issue of Dragon Update bearing the inscription 'news for September', and it's nearly the end of July. It's an arrangement known as the 'double time schedule' in drama circles,

Can't stand printers?

VIGLEN has announced a new range of printer stands for use with most 80 or 130 column printers.

At the bottom of the range is a metal stand finished in black, designed for use with the Centronics OLP printer. There is a larger version of this stand with a paper roll holder.

Two models of smoky or clear look perspex stand are available, with room for

continuous stationary undermedia.

Viglen also supplies a high-impact plastic printer stand, colour co-ordinated to the steel printer stands, with room for 1,000 sheets of continuous stationery.

Prices range from a very affordable £9.95 up to £29.95. See your computer dealer, or contact Viglen on 01 843 9903 for a list of dealers.



and 'started confusing' to Dragon User.

Anyway here are the contents of June's Dragon Update: test run of the US J & R Electronics Markers' Board design from The Random, utility reviews, easy machine code, C64 for beginners, Teletext and SuperDOS, a joystick/cursor key mod, name lists on C64aDOS, a couple of graphics routines, some screen dump templates (and a drawing competition), the usual small ads and a suggestion that DU and Update should rule the world, seeing as how some people seem to think we do. Well, why not, Paul? As long as I get to wear a crown.

Update also warns that business advertisers will have to contribute to costs in future, or risk having their ads 'burned'.

DU thinks this is fair enough. Although Update is not strictly a commercial organisation, they are still in business inasmuch as they have to pay out money for printing etc, just as we do, and need contributions from people using their services.

The National Dragon Users Group can be contacted at 8, Ravenshoe Road, Welling, Sussex. Phone: 0800 265565.

Correction

B. Freeman Walker has written to say: "the printers have misread more than the title in my article. Several lines are missing from the bottom of Figure 1 on page 18 of the July issue, which will my doubt cause some readers to wonder what has happened. (For just readers — Ed.) Here are the missing notes:

1. There is no Elite facility.
2. There are no ESC P codes.
3. The ENLARGED mode is only available by SO (= Shift Out) CHR\$14).
4. The COMPENSED mode is only available by SI (= Shift In), CHR\$15).
5. There is no half facility (ie No ESC 4 or ESC 5, or alternatives).

Dragon guide book

Program: Magbase
Supplier: Pulver Software, 38
Foxhill, High Grompton, Shaw,
Oldham, Lancs OL2 7MG
Price: various according to
versions

THESE HAVE BEEN surprisingly few database programs written for the Dragon since the late arrival of the disc system, and most of those packages that did reach the shelves (can you remember buying Dragonsoftware from a shop?) failed miserably due either poor programming or weak program design. Having got myself a reasonable database program what do you use it for? Computers are ideally suited for sorting and searching through large amounts of information but what kind of information do most home computers have that requires a computer to sort it out for them? Why, keeping track of the wonderfully witty and informative articles in our beloved Dragon User magazine. Here you both try!

Pulver Software have now released a database program which has been specifically written for indexing magazine articles and comes either on its own or with a choice of photos that contain an index of the articles from within the covers of such esteemed journals as Dragon User and Dragon Update. The program is available on cassette and disc versions and available for the local systems including Dragon32S, Dragon32 and Commodore64.

The program is written in BASIC which is ideal for use in small database situations and has been around long enough that there are no 'bugs' in it. Records may be searched for using either a 'target' string or range of record numbers and output, as you would expect, may be directed to either the screen or the printer. The printer routines are, by default, set up for Seikosha or Tandy printers but this may be re-configured to suit your own system. All the other usual database functions are provided to allow sorting, record modification and addition etc. etc.

Trying to remember which issue a particular article was in is usually impossible. Magbase will not only find it for you but will point out other articles on the

same subject. Magbase must be worth its asking price for the Dragon User index alone without the database software. The only real snag with the Magbase program is its elegance. Having selected and confirmed an option it is annoyingly tedious to press a key to start. It's a small gripe I know, but when you use the program for more than a few minutes it becomes very annoying.

Ray Coates



Success for the search

Program: Data Retrieval
System, G.H.S.
Supplier: Quicksort Software, 2 Bessie Close,
Rexford, E. Sussex BN45 3JZ
Price: £9.95

THE introductory screen has a 1980 copyright message, but on the main menu the date is 1983. This, coupled with the title, leads me to suspect that this program shares a common ancestry with the Salamander DMS System which was around in the early days of the Dragon. Never mind the history, what does it do and how well does it do it? Well basically it is a database system and it works extremely well.

The program is supplied on cassette, but the manual gives instructions for transferring to disc (CLAR 1000s if transferable disc — that's been omitted from the manual). In its cassette form the program consists of 22,000 characters of data, all held in memory at once. A disc file can be as large as 154,000 characters and is treated as up to 7 segments of 22,000 characters each. Data is stored as a number of records, each of which can contain up to 480 characters split into 36 fields. Data is input and processed via very flexible user definable screen layouts, and record displayed at a time with full screen editing facilities. The program is written in machine code and works very fast.

So how do you use the program? Having loaded it, a menu

is displayed suggesting you press 0 to design your screen layout. You then set up the format of the screen and the number, size and type of each field in the record; you can also add titles to the fields. The photograph shows a typical format screen, defining 18 fields (A-I are alphanumeric and 1-6 are numeric). For example, the format for 'BIRTHDAY' defines that up to three entries may be made consisting of a two digit number for the date, a three character month and a four digit year. Having completed the screen layout this is saved and you return to the main menu. You now start adding data by selecting the A command. Data can only be entered into the defined fields and number of the correct type, is only numbers entered into a numeric field. As each field is filled the next is selected by using either the (ENTER) key or the cursor arrows. You do not need to fill all fields, the program goes quite happily with empty ones. When a record is complete, you press (BRIEF) and are prompted by 'Add' to press (ENTER), you are then prompted by 'OR Newfile N' so press (ENTER) to get an entry and you are ready for filling the next record. I found this tedious, but it works and gives maximum flexibility. The second photograph shows a typical record screen. You can continue entering data until you have completed a full list of your friends, their addresses, children's ages or whatever.

Having got your database, what can you do with it? The first thing is to save to tape or disc in case of power failure! Then you can reformat it if you don't like the original screen design, update records, print a list either in total or selectively, but most

importantly you can do search-commands. 'Number 5' from the main menu and you are presented with a blank version of your original screen design. Into this you can enter search characters in any position, a range for the initial character of a field and ranges for numerical values, eg 10; the program then ANDs these all together and does a search for all records that meet all these criteria, eg you could do a search for all people whose names begin with a letter between J and P, who live in Northampton and have a child less than 5 years old, or look for all music by Beethoven recorded by the LSO in 1984.

Just a few minor criticisms of the program: it's written for the Dragon32 and can't take advantage of the extra storage provided by the DMS. As with a great many Dragon programs, you are committed to upper case letters only if you would have been nice if they had added a lower case driver using the graphics screen (although this would reduce storage capacity), and three key strokes to enter each new data record really is a bit tedious. Finally, if you are not lucky enough to have a disc drive, don't think it really worth bothering to try and write anything serious with any database program using cassette storage, it's just too slow; you could have looked up a written version of the information in half the time.

To sum up, if you've got a Dragon with a disc drive, and you've not got too many CDs and you want to make serious use of it, then this really is a must for you. It is a piece of professional software at an amateur price.

Denise Henshaw



Datsort

Mike Hosken presents a database program which just grew . . .

THIS is a long program, because it does so many useful jobs. But it's not as dreadful as it type in as some of your more major rewrite/crate listings. It's not particularly well structured (might even be accused of suffering from the spaghetti syndrome). The reason is that the program has gradually evolved, with extra facilities being added as my needs expanded. And I simply haven't re-structured it for fear of bugs.

There is quite a lot to say, so I will do it in note form.

Description:

This is a program of approximately 12K which will accept any form of 'tabulatable' data; i.e. input, alter or delete headings or records; sort numerically or alphabetically on any field; save/load using DragonDOS including an option to combine like sorted databases into a sorted master database; compile an index by optional combination of identical entries; print a customized situation, either a whole database or by use of up to three simultaneous selector keys; total and average numerical data; all or selected.

Example:

Table 1 gives details of variables in Datsort compiled as Datsort. (Note that sorting is operational on both fields: record numbers entries are alphabetical within the first column's sorted sequence.)

Hardware:

Datsort will run on any Dragon but CLEAR, PEEKs and POKEs are for Dragon 32. Examples printed here were done on a datsortepri printer but program listing CHRS numbers are for the Sekizaka dot matrix printer using continuous stationery.

Program and Operational Notes:

Line 240 if your printer does not have automatic line feed on using the last character then the full printer width can be used.

Line 250: not possible on other kinds of database programs, where fields have to be specified before you start, regardless. In practice, 'fields can grow' is much the more convenient.

Line 420: means getting the wrong sort

sorting will treat 2 as greater than 100!

Line 500: invaluable if you are compiling an index, to a book perhaps — or list of Dragon Users.

Subroutine 600 to 650 produces a marker to show present maximum field width.

270-290: can be inserted if you would like to have your files based on screen before making a choice.

Line 1000 sends you back for another try if you don't specify a proper file title: it may be safer to exit back to the menu with THEN 1200 if you prefer.

Data could be lost if this same happened at line 1400: so again, THEN 1200 (instead of 1000).

Line 1440: to make use of this facility (which saves both time and memory under many circumstances), process database A, sort it, and save to disc. Re-RUN with database B, and sort it (follow database A, effectively on top of B). (Re-sorting at this stage would, if the memory is now almost full, take a very long time.) (Save onto disc, which can be done as a sorted combination AB. Re-RUN, Loading AB for printing, modification, arithmetic, etc.)

Line 1840: sorting usually uses the fastest swapping procedure but this can be overcome here: (i.e. sort looks titles first, then sort by authors but 'retain previous sequence': thus Dickens's novels will be in alphabetical order but all before Shaw's plays (in alphabetical order).

Line 2280: any headings are printed to the left margin so only exceptionally should spaces be inserted to the left of the first field.

Line 2360: CHRS (14) puts the printer into enhanced mode and CHRS (15) returns it to normal.

Line 2440: tabulations are easier to read in blocks of five lines.

Line 2480: using INKEYS rather than INPUT status is easier to browse records using M option. For other options don't press ENTER until AFTER selecting the second number (or change to INPUT if preferred.)

With the Delete option the gap in the array is filled by bringing up the last entry rather than moving ALL records up one (which would be too slow). So deleting should be done before sorting where

possible. Also, any systematic editing should start at the end and work upwards, ideally.

Line 2600: any search goes right through the database, rather than stopping after finding one appropriate entry.

I hope line 2670 is clear enough, if the displayed field entry is single then just press ENTER to retain it. If it's NOT single then type in everything that you want in that field (including what was in it previously if you merely want to extend it) and THEN press ENTER.

Line 3880 would, on a database of second-hand cars, pick out all the 'Ford' models, and line 3880 all the imported versions if the model number ends in 'I'. Line 3700 enables it to select the ones priced below say 2000, but on a members' list it could check all those with names starting with S or earlier in the alphabet.

Line 4100 is simply an anti-tiltation safety device. But it is so important that it demands a three-key response whereas the usual ones have been the two-key OK or the single-key Y or N: if your universal preference is for Y/N then programs all attach choices in whichever way you like.

Incidentally, Datsort files can be loaded into a word processor or perhaps into a label-printing utility program to add even greater flexibility to the whole system. But if you've already got some data and you want to convert it into Datsort format you need simply to build a character program. This can be done if you CHAIN the loading version of your own program, with a small module section if any processing is necessary (such as the addition of Datsort flags as listed in Table 1), and the 'Save data on disk' sector of Datsort.

Personal Note:

Not my prettiest program: it grew a bit haphazardly, but it is much my most useful one (even if accountants are actually less than impressed).

I have another version for tape storage, and I would be interested to hear if anyone is interested in that.

(Mike Hosken is not an easy chap to get hold of these days, but if anyone is interested in alternative versions, drop us a line, and we will see if we can get in touch with him eventually.)

```
10 FOR DATASORT database sort, store and tabulate: SEKIZAKA printer on
2 DIM FILE EDITOR.
30 CLS
40 PRINT #12,"DATASORT"
50 PRINT #204,"STORAGE:8,243"
60 PRINT #209,"MULTI SEKIZAKA PRINTER"
70 PRINT #205,"AND DISK FILES"
100 PRINT #102,"A PROGRAM TO STORE NUMERIC AND/OR NUMERICAL DATA AND SORT
110 IT INTO AND ORDER."
80 PRINT #496,"PRESS ANY KEY..."
90 CLEAR 0: CLEAR 2000
100 DIM #4(3),#1(3),#2(3),#3(3)
```

```

110 IF INDEX=0 THEN 115
120 CLS: PRINT #56,"DO YOU WISH TO RE-ENTER OLD DATAFROM DISK? (Y/N)"
130 INPUT M
140 IF M<>"Y" AND M<>"N" THEN 130
150 CLS: IF M="Y" THEN 170
160 REM >>>>>>>>> setting up data records
170 PRINT #56,"ENTER ANY TITLE OR LIST-HEADINGS FOR THE WHOLE SYSTEM
      (OR JUST 'ENTER' BY ITSELF)."
```

180 LINE INPUT T\$: CLS

190 PRINT #56,"HOW MANY ITEMS OF DATA (FIELDS) MAKE UP EACH LINE (RECORD)?"

200 INPUT B: B=B-1: CLS

210 IF B=1 THEN GOTO 190

220 A=1000/(B+1)

230 DIM F\$(A,B),C\$(B),H\$(B),R\$(B),SL\$(B)

240 PRINT "FOR PRINTING AT ONE LINE PER RECORD PLEASE PLAN AN ADEQUATE NUMBER SPACES (AND PRINT CAPED) TO TOTAL A MAXIMUM OF 19." PRINT

250 PRINT "1 = FIELDS FIELD WIDTHS" G = FIELDS CAN SHOW": PRINT

260 INPUT "GIVEN": G: CLS

270 IF B=1 AND G=0 THEN 290

280 PRINT "INPUT ANY FIELD TITLES/HEADINGS."

290 FOR L=0 TO B

300 PRINT "FIELD*L+1:

310 LINE INPUT F\$(L,L)

320 SL(L)=LEN(F\$(L,L))

330 IF B=0 THEN 290

340 INPUT "FIELD WIDTHS":SL(L)

350 IF LEN(F\$(L,L))>SL(L) THEN PRINT "HEADINGS TOO WIDE!": GOTO 300

360 NEXT L

370 CLS

380 FOR L=0 TO B: PRINT F\$(L,L): IF B=1 THEN PRINT "WIDTH*SL(L)

390 NEXT L

400 INPUT "TYPE 'OK' OR 'NO'..."A\$: CLS

410 IF A\$<>"OK" THEN 290

420 PRINT "INDICATE WHICH TYPE OF DATA IS TO BE DEALT WITH IN EACH FIELD: M = NUMBERS OR L = LETTERS ETC.": PRINT

430 FOR L=0 TO B

440 PRINT "FIELD*L+1:F\$(L,L)" :

450 INPUT M

460 IF A\$<>"M" AND A\$<>"L" THEN 450

470 IF A\$="L" THEN C\$(L)=1 ELSE C\$(L)=0

480 NEXT L

490 INPUT "TYPE 'OK' OR 'NO'..."A\$: CLS: IF A\$<>"OK" THEN 420

500 PRINT "SHOULD RECORDS WITH IDENTICAL": PRINT F\$(0,0)

510 INPUT "ENTRIES BE COMBINED? (Y/N)":A

520 IF A\$<>"Y" AND A\$<>"N" THEN 500

530 IF A\$="Y" THEN C\$(1)=1

540 CLS: PRINT "NOW IS THE TIME TO START ENTERING ALL THE DATA."

550 REM >>>>>>>>> data input

560 PRINT "USE ### AS A DUMMY ENTRY TO END DATA INPUT."

570 F\$(0,1): IF B=0 THEN PRINT "STORAGE AREAS NOW FULL.": GOTO 1030

580 PRINT "RECORD NUMBER":M

590 PRINT STR\$(M(1))-LEN(STR\$(M(1)))

600 FOR L=0 TO B

610 IF F\$(L,L)<>" " THEN PRINT F\$(L,L) ELSE PRINT "DATA FOR FIELD*L+1

620 GOTO 640: GOTO 640

630 B=FIELD\$(0)/256+FIELD\$(1)

640 IF B=SL(1)+155 THEN PRINT #511: PRINT #2-1036,: GOTO 630

650 F\$(B=SL(1),M): RETURN

660 LINE INPUT F\$(B,L)

670 IF F\$(B,L)="" THEN B=B-1: GOTO 1030

680 IF L=B OR B=1 OR C\$(0)=0 THEN 740

690 B=B

700 FOR K=1 TO M-1

710 IF F\$(K,L)="" THEN F\$(K,L) THEN PRINT "RECORD NUMBER": M=K: B=B

720 NEXT K

730 IF B=0 THEN B=B-1: GOTO 1030

740 IF LEN(F\$(K,L))>SL(L) AND B=0 THEN SL(L)=LEN(F\$(K,L)): GOTO 640

750 IF LEN(F\$(K,L))>SL(L) AND B=1 THEN F\$(K,L)=LEFT\$(F\$(K,L),SL(L))

760 NEXT L

770 CLS

780 PRINT F\$(0,0)*256+FIELD\$(1)-FIELD\$(1)*256-FIELD\$(0)"memory free"

790 PRINT #21,"TIME TO STOP":

800 L=0: GOTO 1030

810 PRINT

```

820 GOTO 570
830 REM >>>> check line length
840 W=0: S=1
850 FOR LL=0 TO 8
860 W=W+CLL(11)*256**LL: IF W>1100 THEN S=1
870 NEXT LL
880 PRINT "LINE LENGTH="W;
890 IF S=1 THEN PRINT "INCL. GAPS." ELSE PRINT "WITH NO GAPS."
900 IF J=0 THEN GOTO 910 ELSE IF J=3 THEN RETURN
910 FOR LL=1 TO 500: NEXT LL
920 RETURN
930 FOR LL=0 TO 8
940 PRINT "FIELD"LL+1,CL(11)*CHARACTERS"
950 NEXT LL
960 IF INKEY="" THEN GOTO 960 ELSE 1210
970 REM >>>>>>> reading data from disk
980 PRINT #4,"INPUT THE NAME OF THE REQUIRED DATA FILE."
990 INPUT N$
1000 IF N$="" THEN GOTO
1010 ELSE
1020 PRINT #4,"CHECK THAT THE DISK IS IN PLACE,PRESS ANY KEY WHEN RE
ADY...."
1030 IF INKEY="" THEN GOTO
1040 CL$: PRINT #2,N$;N$
1050 FPRDAD N$;A
1060 FPRDAD N$;B
1070 FPRDAD N$;C#
1080 FPRDAD N$;Y
1090 FPRDAD N$;U
1100 FPRDAD N$;V#
1110 IF N=C THEN DIS C(B),FPR(A,B),N#(B),B(C),CL(B)
1120 FOR L=0 TO 8: FPRDAD N$;CL(L): FPRDAD N$;B: IF B=CL(L) THEN CL(L)=C
1130 NEXT L
1140 FOR L=0 TO 8: FPRDAD N$;FPR(G,L): NEXT L
1150 FOR L=N+1 TO N+7
1160 FOR LL=0 TO 8
1170 FPRDAD N$;FPR(L,LL): PRINT FPR(L,LL)
1180 NEXT LL,L
1190 GOTO
1200 N=N+1: IF N=Y THEN I=0
1210 REM >>>>>>>> menu
1220 ELSE
1230 PRINT #3,"main menu"
1240 PRINT #3,"1 = SAVE DATA ONTO DISK"
1250 PRINT #3 = SORT DATA INTO A NEW ORDER"
1260 PRINT #3 = PRINT"
1270 PRINT #3 = INSPECT/ALTER/DELETE DATA"
1280 PRINT #3 = ADD MORE DATA"
1290 PRINT #3 = CHECK LINE LENGTH"
1300 PRINT #3 = ABORT/QUIT"
1310 PRINT #3 = LOAD EXTRA DATA FROM DISK"
1320 PRINT #3 = CHANGE MAIN TITLE": PRINT
1330 PRINT #3 = FINISHED": PRINT
1340 INPUT "WHICH NUMBER?":J: CL$
1350 IF J=9 THEN GOTO: GOTO 1230
1360 IF J=0 THEN GOTO
1370 ON J GOTO 1380,1370,2100,2100,2620,2780,840,3120,970,4100
1380 REM >>>>>>>> saving data onto disk
1390 PRINT "INPUT AN 8-CHARACTER FILE NAME -";
1400 INPUT N$
1410 IF N$="" OR LEN(N$)>8 THEN 1390
1420 IF Y=C THEN GOTO: GOTO 1490 ELSE G=1
1430 PRINT "IF BOTH TWO DATA FILES ARE AVAILABLE THEY CAN BE SAVED A
S A COMBINED-SORTED FILE."
1440 INPUT "DO YOU WISH THIS TO BE DONE? (Y/N)":M$
1450 IF M$="Y" AND M$<>"N" THEN 1430
1460 IF M$="N" THEN G=0: GOTO 1490
1470 INPUT "WHICH FIELD NUMBERS FOR SORTING? ";S: S=C+1
1480 IF S=0 OR S=8 THEN GOTO: GOTO 1470
1490 PRINT: PRINT "CHECK THAT THE DISK IS IN PLACE,PRESS ANY KEY WHEN
READY...."
1500 IF INKEY="" THEN GOTO 1500
1510 CL$
1520 N=1: N=C+1
1530 PRINT #3,"SAVING YOUR ";N$;" DATA FILE."

```

```

1540 WRITE M$;A
1550 WRITE M$;B
1560 WRITE M$;C#
1570 WRITE M$;D
1580 WRITE M$;E
1590 WRITE M$;F#
1600 FOR L=0 TO N: WRITE M$;G(L): WRITE M$;H(L): NEXT L
1610 FOR L=0 TO N: WRITE M$;P(L),L: NEXT L
1620 FOR L=1 TO N-1
1630 IF G=0 THEN S=L: GOTO 1650
1640 IF P(M,L) < P(N,L) OR S=N THEN S=N: N=N+1 ELSE S=S: N=N+1
1650 FOR LL=0 TO S
1660 WRITE M$;P(S,LL): PRINT P(S,LL)
1670 NEXT LL,L
1680 IF G=0 OR S=N THEN S=S ELSE S=N
1690 FOR L=0 TO S: WRITE M$;P(S,L): PRINT P(S,L): NEXT L
1700 CLINK: GOTO 1210
1710 REM >>>>>>>>> sorting procedure
1720 FOR L=0 TO S
1730 PRINT "FIELD*L=1*IS ":
1740 IF G(L)=1 THEN PRINT "ALPHABETICAL" ELSE PRINT "NUMERICAL"
1750 IF P(S,L) < 0 THEN PRINT P(L),L
1760 NEXT L
1770 INPUT "WHICH FIELD IS TO BE SORTED?";S: S=S-1
1780 IF S < 0 OR S > S THEN CLINK: GOTO 1710
1790 IF S(L)=1 THEN LINK
1800 PRINT: PRINT "CHOOSE THE REQUIRED SORT:=": PRINT
1810 PRINT "1 = DECREASING (TOP FIRST)      0 = INCREASING"
1820 INPUT M
1830 IF M < 1 AND M > 0 THEN CLINK: GOTO 1800
1840 PRINT "CHOOSE AGAIN:="
1850 PRINT "1 = FASTER"
1860 PRINT "0 = RETAIN PREVIOUS SEQUENCES"
1870 INPUT M: CLS
1880 IF M < 1 AND M > 0 THEN CLINK: GOTO 1840
1890 FOR L=1 TO N
1900 M=L
1910 IF G(L)=1 THEN LINK ELSE IF M=1 THEN 1950 ELSE 1960
1920 FOR LL=N TO S: IF P(M,LL) < P(M,L) THEN S=LL
1930 NEXT LL
1940 GOTO 1800
1950 FOR LL=N TO S: IF VAL(P(M,LL)) < VAL(P(S,L)) THEN S=LL
1960 NEXT LL
1970 GOTO 1800
1980 FOR LL=N TO S: IF VAL(P(M,LL)) < VAL(P(S,L)) THEN S=LL
1990 NEXT LL
2000 IF S=L THEN FOR LL=0 TO S: PRINT P(L,LL): NEXT LL: GOTO 1830
2010 IF S=1 THEN 2030
2020 FOR LL=0 TO S: D=P(M,LL): P(M,LL)=P(L,LL): P(L,LL)=D: PRINT
P(L,LL): NEXT LL
2030 NEXT L
2040 GOTO 1210
2050 FOR LL=0 TO S: H(LL)=P(M,LL): NEXT LL
2060 FOR LL=N-1 TO 1 STEP -1
2070 FOR LL=0 TO S: P(LL+1,L)=P(LL,LL): NEXT LL,LL
2080 FOR LL=0 TO S: P(LL,LL)=H(LL): PRINT P(LL): NEXT LL
2090 GOTO 1830
2100 REM >>>>>>>> printing
2110 CLS
2120 PRINT #9, "PRINTING MENU ":
2130 PRINT #9, "1 = ONE NUMBERED RECORD"
2140 PRINT "2 = SELECTED RECORDS TRANSLATED"
2150 PRINT "3 = ALL RECORDS TRANSLATED": PRINT
2160 PRINT "4 = RETURN TO MAIN MENU"
2170 PRINT #999, "INPUT YOUR CHOICE":
2180 INPUT M: CLS
2190 IF M < 1 OR M > 4 THEN CLINK: GOTO 2120
2200 IF M=4 THEN LINK: GOTO 1210
2210 PRINT "FILING THE REQUIRED TRANSLATION PARAMETERS:=": PRINT
2220 IF M(1)=0 THEN 2240
2230 PRINT "IS THE PREVIOUS TRANSLATION LAYOUT ALRIGHT?"
2240 INPUT "TYPE 'OK' OR 'NO'...":M: CLS
2250 IF M="OK" THEN 2120
2260 FOR L=0 TO S
2270 PRINT "FIELD*L=1;P(S,L)

```

```

2250 INPUT "NOW ENTER SPACES TO THE LEFT OF THE FIELD ENTRY";R(L)
2260 IF R(L)<0 OR R(L)>50 THEN PRINT "DON'T BE HAPTY!": GOTO 2250
2300 PRINT: NEXT L
2310 CLS
2320 PRINT #10,"PLEASE CHECK THAT THE PRINTER ISREADY, AND THEN PRESS
'ENTER'."
2330 INPUT #1
2340 PRINT "THE PRINTER STILL ISN'T READY, FOR SOME REASON. PLEASE
CHECK AND REKEYTY."
2350 PRINT #2: CLS
2360 IF R=1 THEN GOSUB 2370: GOSUB 2310: GOTO 2100
2370 IF R=2 THEN 2440
2380 PRINT #20,"Output to the printer"
2390 IF LEN(R)>1 THEN PRINT #2,CERR(14/70): PRINT #2,STRINGS(LEN(R))
    R=1ERRR(10)
2400 IF LEN(R)>(R/2))+LEN(R)>(0,1))=0 THEN PRINT #2: GOTO 2440
2410 PRINT #2
2420 L=0: GOSUB 2310
2430 PRINT #2
2440 FOR L=1 TO R
2450 GOSUB 2310
2460 IF L=INT(L/5)*5 AND L<R THEN PRINT #2
2470 NEXT L
2480 PRINT #2
2490 GOTO 2100
2500 REM >>>> tabulating a record on the printer
2510 R=0
2520 FOR LL=0 TO R
2530 R=R+R(11): PRINT #2,TAB(R)R(1,LL): R=R+R(11)
2540 NEXT LL
2550 PRINT #2: RETURN
2560 REM >>>> searching record number
2570 PRINT #20,"INPUT THE number OF THE RECORD WHICH IS TO BE LISTED
ON THE PRINTER (OR '0' IF NOT KNOWN, THEN SEARCHED FOR)."
2580 INPUT L
2590 IF L=0 THEN CLS: GOTO 2630
2600 IF L>R THEN CLS: PRINT "THERE AREN'T THAT MANY ENTRIES!": GOTO 2
610
2610 CLS: RETURN
2620 REM >>>>>>>> inspecting/altering data
2630 PRINT "PRESS -"
2640 PRINT "ALTER DELETE INSPECT NEXT MENU";
2650 R=1ERRR(1)
2660 IF D<>"A" AND D<>"C" AND D<>"I" AND D<>"N" AND D<>"R" THEN 2
670
2670 CLS
2680 IF D<>"N" THEN 1210
2690 IF D<>"R" THEN L=L+1: IF L<R THEN 2770 ELSE 1210
2700 PRINT "INPUT THE number OF THE ENTRY OR '2' FOR A SEARCH."
2710 INPUT R
2720 IF VAL(R)>R THEN PRINT "THERE AREN'T THAT MANY ENTRIES!": GOTO 2
680
2730 IF VAL(R)>0 AND R<>"2" THEN 2700
2740 IF R<>"2" THEN 2810
2750 CLS: IF D<>"A" THEN 2860
2760 L=VAL(R)
2770 GOSUB 2090
2780 IF D<>"I" OR D<>"R" THEN 2640
2790 INPUT "TYPE 'GO' TO DELETE (OR 'KEEP' TO RETAIN)...";
D
2800 IF D<>"GO" THEN CLS: GOSUB 1090: PRINT: GOTO 2640
2810 FOR LL=0 TO R: R(1,LL)=R(R,LL): NEXT LL
2820 R=R-1: CLS: GOTO 2640
2830 PRINT "WHICH FIELD IS TO BE SEARCHED? (1 TO 9+1)"
2840 INPUT M: R=R-1
2850 IF M<0 OR M>9 THEN 2890
2860 PRINT "NOW INPUT THE ";
2870 IF D(R)=0 THEN PRINT "NUMERICAL ";
2880 PRINT "DATA TO BE FOUND."
2890 LINE INPUT M#
2900 CLS: R=0
2910 FOR L=1 TO R
2920 IF M<R(1,L): THEN GOSUB 1090
2930 NEXT L
2940 IF R=0 THEN PRINT "searched but with nil result"

```

```

3490 GOTO 3490
3500 M=VAL(P1)
3510 PRINT "INPUT NEW DATA OR "ENTER" ONLY TO RETAIN PRESENT FIELD IN
    "
3520 FOR L=0 TO 5
3530 PRINT P1(M,L)
3540 GOSUB 3550
3550 LINE INPUT M1
3560 IF M1<>" " THEN P1(M,L)=M1: IF LEN(P1(M,L))>20(L) AND M=0 THEN SL(
    L)=LEN(P1(M,L)): GOSUB 350
3570 IF M=1 AND LEN(P1(M,L))>20(L) THEN P1(M,L)=LEFT$(P1(M,L),20(L))
3580 NEXT L
3590 CLS: L=M: GOSUB 3540
3600 IF M=0 THEN 350
3610 GOTO 3490
3620 REM ***** listing a record as you.
3630 PRINT "*****"
3640 FOR LL=0 TO 5: PRINT P1(LL): NEXT LL
3650 G=1: RETURN
3660 REM ***** specifying functions
3670 PRINT #4,"YOU CAN SEE TOTALS AND AVERAGES FOR ALL NUMERICAL DATA
    - EITHER FROM ALL OR SELECTED RECORDS." : PRINT
3680 PRINT "THE NUMERICAL FIELDS ARE:"
3690 FOR L=0 TO 5
3700 IF L(1)=0 THEN PRINT "FIELD"*(L+1);P1(0,L)
3710 NEXT L
3720 INPUT "WHICH FIELD NUMBER?";K: K=K-1: CLS
3730 IF K=0 THEN 3490
3740 IF C(1)=0 THEN 3490
3750 PRINT #4,"1 = ALL RECORDS"
3760 PRINT "0 = SELECTED RECORDS"
3770 INPUT "CHOOSE 1 OR 0?";M: CLS
3780 IF M=0 AND M<>1 THEN 3210
3790 AT=0: AS=0
3800 IF M=0 THEN 3330
3810 FOR L=1 TO 5
3820 AT=AT+VAL(P1(L,K)): PRINT #3,AT
3830 IF VAL(P1(L,K))>0 THEN AS=AS+1: PRINT #2,AS
3840 NEXT L
3850 GOTO 3330
3860 GOSUB 3470
3870 FOR L=1 TO 1000: NEXT L
3880 CLS: PRINT #4,"TOTAL OF "P1(0,K)
3890 IF M=0 THEN PRINT "FOR THE SELECTION(S) GIVEN"
3900 PRINT "IS AT:" IF AT=0 THEN 3470
3910 IF M=1 THEN 3400
3920 PRINT "ON THE "AN" RELEVANT ENTRIES"
3930 PRINT "WITH AVERAGE ENTER OF AT/AS
3940 PRINT "AND AVERAGE OVER ALL"
3950 PRINT "RECORDS OF AT/E
3960 PRINT #4,,"PRESS 'ENTER' WHEN READY..."
3970 INPUT #4: GOTO 3210
3980 REM ***** selective print
3990 PRINT "YOU CAN HAVE A PRINTED TABLE OF ALL RECORDS WHICH COMPLY W
    ITH YOUR SPECIFICATIONS." : PRINT
4000 GOSUB 3470: PRINT #2: GOTO 3490
4010 REM ***** selecting records
4020 PRINT "WORD KEYS CAN BE THEMSELVES OR LEFT-END OR RIGHT-END."
4030 PRINT "ANY KEY CAN BE = OR < OR >." : PRINT
4040 PRINT "INPUT 0 AT ANY STAGE TO ABORT BACK TO THE MAIN MENU.":
    PRINT
4050 INPUT "DO YOU WISH TO SPECIFY      1 OR 2 OR 3 SELECTION KEY(S
    )";M: CLS
4060 IF M=0 OR M>3 THEN 3540
4070 IF M=0 THEN 3210
4080 FOR L=1 TO 3
4090 FOR LL=0 TO 5: PRINT LL+1;P1(0,LL): NEXT LL
4100 INPUT "WHICH FIELD NUMBER";Y(L): Y(L)=Y(L)-1 :CLS
4110 IF Y(L)>5 THEN 3490
4120 IF Y(L)=-1 THEN 3200
4130 PRINT P1(0,Y(L))
4140 INPUT "INPUT THE SELECTION KEY WORD OR KEY VALUE";O(Y(L)): CLS
4150 IF O(Y(L))="" THEN 3490
4160 IF C(Y(L))=0 THEN Y(L)=1: GOTO 3700
4170 PRINT "WHICH CRITERION ="
4180 PRINT "1 = ONLY "O(Y(L))" AND ALL "O(Y(L))

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```

3650 PRINT "2 = "S(L)" AT LEFT END"
3660 PRINT "3 = "S(L)" AT RIGHT END"
3670 INPUT TIL: PRINT
3680 IF TIL<0 OR TIL>3 THEN 3630
3690 IF TIL=0 THEN 3710
3700 PRINT "INPUT THE REQUIRED SELECTION -"
3710 PRINT "1 = "S(L)" SALS"
3720 PRINT "2 = UP TO "S(L)
3730 PRINT "3 = AFTER/GREATER THAN "S(L)
3740 INPUT VIL: GOS
3750 IF VIL<0 OR VIL>3 THEN 3700
3760 IF VIL=0 THEN 3710
3770 NEXT L
3780 GOS
3790 FOR L=1 TO N
3800 PRINT L: P=1
3810 FOR LL=1 TO N
3820 IF P=0 THEN 4000
3830 ON TIL(0) GOTO 3840,3850,3860
3840 ON VIL(0) GOTO 3870,3880,3890
3850 ON VIL(0) GOTO 3900,3910,3920
3860 ON VIL(0) GOTO 4010,4020,4030
3870 IF P(L,VIL(0))<S(LL) THEN P=0
3880 GOTO 4000
3890 IF C(TIL(0))=0 AND VAL(P(L,VIL(0)))>VAL(S(LL)) THEN P=0
3900 IF C(TIL(0))=1 AND P(L,VIL(0))<S(LL) THEN P=0
3910 GOTO 4000
3920 IF C(TIL(0))=0 AND VAL(P(L,VIL(0)))<VAL(S(LL)) THEN P=0
3930 IF C(TIL(0))=1 AND P(L,VIL(0))<S(LL) THEN P=0
3940 GOTO 4000
3950 IF LEFT$(P(L,VIL(0)),LEN(S(LL))>S(LL) THEN P=0
3960 GOTO 4000
3970 IF LEFT$(P(L,VIL(0)),LEN(S(LL))<S(LL) THEN P=0
3980 GOTO 4000
3990 IF LEFT$(P(L,VIL(0)),LEN(S(LL))<S(LL) THEN P=0
4000 GOTO 4000
4010 IF RIGHT$(P(L,VIL(0)),LEN(S(LL))<S(LL) THEN P=0
4020 GOTO 4000
4030 IF RIGHT$(P(L,VIL(0)),LEN(S(LL))>S(LL) THEN P=0
4040 GOTO 4000
4050 IF RIGHT$(P(L,VIL(0)),LEN(S(LL))<S(LL) THEN P=0
4060 NEXT LL
4070 IF P=1 THEN GOS: 4080: IF J=3 THEN GOS: 4500 ELSE RT=RT+VAL(P(L,
L,S)): RT=RT+1
4090 NEXT L
4095 RETURN
4100 REM >>>>>>>>> change main 4100
4110 PRINT "INPUT THE NEW TITLE"
4120 IF T4="" THEN PRINT "IN PLACE OF": PRINT T4
4130 PRINT: LINE INPUT T4: GOS
4140 PRINT S4,T4: PRINT
4150 INPUT "TYPE 'X' OR 'NO'...":A4: GOS
4160 IF A4="X" THEN 4180 ELSE 4110
4170 REM >>>>>>>>> finished
4180 PRINT S4,"ARE YOU SURE YOU HAVE FINISHED? IF SO TYPE 'END', OR
ELSE PRESS 'ENTER' OR 'STOP'."
4190 INPUT D4: GOS
4200 IF D4="END" THEN 4210
4210 PRINT S4,"finished": PRINT S4,"dataset"
4220 REM M.J. HOUSE

```


VARIABLES used in DATASORT program - disk version

```

N      MAXIMUM NUMBER OF RECORDS = LENGTH OF ARRAY
NR     RE-ENTERABLE RESPONSE
NN     NUMBER OF NON-ZERO VALUES BEING TOTALLED AND AVERAGED
NT     TOTAL OF ALL VALUES DURING ARITHMETIC OPTION
N      NUMBER OF FIELDS PER RECORD MINUS 1 = WIDTH OF ARRAY

C(N):  FLAG:  0=NUMERICAL, 1=STRING
        FLAG:  1=MARKED RECORD WITH IDENTICAL FIRST FIELD
NR     RE-ENTERABLE RESPONSE
E      -
PA(A,N) MAIN DATA ARRAY, A LONG BY N WIDE

PA(O,N) FIELD TITLES - IF ANY
CA(S)  SELECTOR FOR PRINT
N      FLAG:  0=SOBTRIFICATED SORT, 1=FAST SORT
N      NUMBER OF SELECTOR BITS
NA     NAME OF DATA FILE (TEMPORARY)

NR(N)  SPACE ARRAY FOR DOING SERIES OF SWAPS
J      MAIN MENU SELECTOR
K      FIELD SELECTOR FOR SORTING
K      PRINT-TAG VALUE
KK     FLAG:  1=RECORDS HAVE BEEN COMBINED

L      LOOP CONTROL
LL     INNER LOOP CONTROL
LS     TERTIARY LOOP CONTROL
N      CONTROL ONE SORTED LIST DURING FILE COMBINING
N      FLAG:  0=INCREASING SORT, 1=DECREASING SORT

N      FLAG:  0=SELECTED RECORDS SUMMED, 1=ALL RECORDS SUMMED
N      PRINT MENU SELECTOR
NR     RECORD SELECTOR FOR ELERATIONS
NR     DATA TO BE FOUND BY SEARCH
N      CONTROL ONE SORTED LIST DURING FILE COMBINING

N      FIELD TO BE EXAMINED IN SEARCHING
PA     RECORD SELECTOR TO INSPECT/ALTER/DELETE
G      FLAG:  1=SUCCESSFUL SEARCH
G      FLAG:  1=COMBINE TWO DATA FILES
N      NUMBER OF RECORDS IN MERGET

S(N):  GAPS TO LEFT OF FORMATTED FIELDS WHEN PRINTING
NF     NUMBER OF RECORDS PER PAGE
S      FLAG:  0=WITHOUT GAPS, 1=GAPS INCLUDED IN PRINT FORMAT
S      NUMBER OF RECORD TO BE PRINTED TO DISK FILE
SL(N)  STRING LENGTHS OF FIELDS

TB     PRINTABLE TITLE FOR WHOLE SYSTEM
T(S)   STRING-AND SELECTOR ONLY/LEFT/RIGHT
G      FLAG:  0=FIELD CAN GROW, 1=FIXED FIELD WIDTHS
V(S)   VALUE SELECTOR = < >
W      TOTAL WIDTH OF PRINT LINE OF LONGEST RECORD

Z      CALCULATOR FOR FINDING POSITION OF INDICATOR CURSOR
Z      NUMBER OF RECORDS INPUT FROM DISK
T(S)   FIELDS INVOLVED IN SELECTION
Z      FIELD AS CRITERION FOR COMBINING FILES
Z      STRING LENGTHS DURING INPUT FROM DISK

```



```

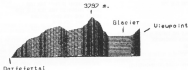
100 PRINTTAB(1)*NOTE: IF SEVERAL HILLS ARE TO BE DRAWN THE STARTING HEIGHT USED SHOULD BE THE
101 HIGHEST OF THEM. IF THE DRAWING OF ONLY ONE HILL IS REQUIRED THIS IS IRRELEVANT
102 100 PRINTTAB(1)*PLACE A # IN COLUMN 40 OF THE LINE IF CONTAINS TO BE SUB-VIEWED. ENTER THE DISTANCE OF
103 EACH DIVISION FROM THE LEFT HAND EDGE OF THE PAPER.
104 100 PRINTTAB(1)*REMARK: EACH DISTANCE IN THE SLICE DIRECTION. "D" UPWARD"= DOWNWARD AND "D"= LEFTWARD"RIGHT"
105 10000 IN SCREEN ARE + , - AND " "
106 PRINTTAB(1)*END THE RUN/ENCE PRESS "F". PRIOR TO PRESSING F PRESS AND END WITH A NUMBER.
107 RELOCATE MUST BE AT LEAST 4 NUMBERS LONG.
108 100 PRINTTAB(1)*PRESS (SPACEBAR TO CONTINUE) THROUGHOUT PROGRAM";
109 IF INPUT(40+D40+12) THEN 200 ELSE 300
110 GOTO 100
111 GOTO 100
112 PRINTTAB(1)*IF GOTO 10000
113 IF GOTO 10000 THEN 200
114 IF GOTO 10000 GOTO 10000
115 IF GOTO 10000 AND F=1 THEN 200
116 IF GOTO 10000 THEN GOTO 10000
117 IF GOTO 10000 AND RELOCATE(10000) AND RELOCATE(10000) AND RELOCATE(10000) THEN PRINTTAB(10000);
118 F=1 GOTO 10000
119 IF LINE(10000) THEN 200 ELSE GOTO 10000
120 GOTO 10000
121 IF ABS(10000) AND ABS(10000) THEN 200
122 IF GOTO 10000 THEN GOTO 10000
123 IF GOTO 10000 THEN GOTO 10000
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279 IF GOTO 10000 THEN GOTO 10000
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282 IF GOTO 10000 THEN GOTO 10000
283 IF GOTO 10000 THEN GOTO
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```

1100 PRINT"TO RECONSTRUCT ANOTHER MOUNTAIN PRESS 'M'"
1110 PRINT"TO REVIEW PICTURE PRESS SPACEBAR"
1120 PRINT"TO PRINT OUT PRESS 'P'"
1130 PRINT"TO CLEAR SCREEN PRESS 'C'"
1140 GOTO1000
1150 PRINT"on SCREEN"
1160 GOTO1000
1170 IF L&=0 THEN 1240
1180 ' 'Y' IS THE VERTICAL SCALING FACTOR
1190 IF P&=0 THEN P&=1: GOTO1140
1200 IF P&=0 THEN 1230 ELSE 1235
1210 GOTO1140
1220 GOTO1230
1230 IF P&=0 THEN P=1: GOTO1140
1240 IF P&=0 THEN PRINT"1: SCREEN, 0: PLOT" GOTO1000
1250 IF P&=0 THEN CLEAR ELSE 1210
1260 FOR S=0 TO 4
1270 DRAW=0: DRAW=0: DRAW=0: DRAW=0
1280 NEXT
1290 L=L+1: ELSE GOTO1140
1300 GOTO1000
1310 IF P&=0 THEN 1320 ELSE 1340
1320 S=0
1330 FOR S=0 TO 4
1340 IF S=0 THEN GOSUB700 ELSE S&=0
1350 IF S=0 THEN PRINT"0:"P&:L+1:":1-04: ELSE
PRINT"0:"P&:L+1:":1-04
1360 NEXT
1370 IF P&=0 THEN PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1380 IF P&=0 THEN PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1390 IF P&=0 THEN PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1400 IF S=0 AND L=0 THEN S=0: S=0: GOTO1000 ELSE 1000
1410 GOTO1000
1420 ' THIS IS THE HORIZONTAL MEASUREMENT
1430 DRAWING(0)=0
1440 RETURN
1450 S&=1: RETURN
1460 IF S=0 THEN S=0
1470 IF S=0:25 THEN S=25
1480 IF S=0 THEN S=0
1490 IF S=0:10 THEN S=10
1500 RETURN
1510 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1520 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1530 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
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1600 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1610 PRINT"0:"P&:L+1:":1-04
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1800 PRINT"0:"P&:L+1:":1-04
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1960 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1970 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1980 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04
1990 PRINT"0:"P&:L+1:":1-04
PRINT"0:"P&:L+1:":1-04

```

The Grossglockner Mountain in Austria



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Winners and Losers

Every month, Gordon Lee will look at some prize programming points from a previous month's competition.

A request for assistance from a number of readers, in particular from Keith Clavel of Casper, who is having difficulty with his cable control limit, we all have our problems!

Like many competitors, he had discovered that determining if a given number is a perfect cube is not so straightforward as it might seem at first sight. The logical method would be to evaluate the cube root and then test this number to see if it was a whole number — perhaps using a simple routine such as: `R=INT (F * 10+0.5)/10` where `F` is the number under test and `F` is the cube root. (Note to non-mathematicians: Raising a number to a power which is a reciprocal is equivalent to finding the appropriate root of that number.)

Unfortunately, with the Dragons, as with most minis, this doesn't always work. Numbers are so interrelated (ought to be) that printing 1, which lists the values of the numbers from 1 to 999, The program doesn't quite compile, and yet it just doesn't work. Starting with a number N , its value is found by direct multiplications (2). The value $\text{mod}(N)$ is then calculated using the line $\text{mod} = (N - 1) / 9$. In an ideal world N should, not surprisingly, be equal to the original value N , and as line 40 should print out a complete list of the integers from 1 to 999. In fact, it succeeds in printing out 119 of these numbers — so 880 of the numbers tested have resulted in an error being made by the computer.

So what has gone wrong? Take the number 1728, the cube of 12. If we type in `PRINT 1728**(1/3)`, the result, 12 is printed out on the screen, so all would appear well. Now try `IF 1728**(1/3)=12 THEN PRINT "CORRECT"`. As this results in no message being printed, the computer clearly regards the two values as not being equal — which we know, mathematically, they are.

To get a clue as to what is happening, type
PRINT 0.00000000 instead of the requested
1000000000. This time you get the result
1.00000000E-09. This strange number, and
note the E-9 at the end, actually
represents the value
0.000000001000000000. What has happen-
ed is that the computer, due to its method of
calculation, has evaluated the result as
10.000000000000000000000000, and this minor
difference from 10 exactly has affected the
result of the test. The reason for this inac-
curacy is that the computer evaluates cube
roots by converting the number to its
logarithmic value, performing a division,
and then calculating the inverse log of this
number. As the computer can only work to a
finite number of decimal places, and the log
involved uses irrational and exists to an
infinite number of decimals, it is necessary
for the computer to make an approximation
— which, as we have noted, can result in an
incorrect answer.

How often do you get involved? How persistent? How motivated? How often do you get involved? How persistent? How motivated?



Before in the magazine, is to convert the value into a string variable, and then back again into a numeric variable, before performing the test. In **Listing 1** this would be effected by inserting line 26:

2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 26

Unfortunately, although this improves the performance of the program, it is still not ideal. The success rate rose to 67 out of 100, so clearly a better method of appointment is now used.

My solution is given as listing 2, which relies on the fact that a straight multiplication (as in line 1000) is exact, at least as far as a nine-digit product is concerned. The method that is used is quite simple:

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1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

ii) Double this result and compare with the number water test

The reason for testing two values at line 1000 is because sometimes the calculation results in a value which is just under the correct answer. For example, the cube root of 1000, the cube of 10, is assessed as being 999.9999, so the extra step is included to cover this eventuality. The actual test is indicated by setting a flag (FL) to 1 if an exact correspondence is made.

With regards to the computer (used as the main difficulty, apart from the one just mentioned), was the length of time that some starting values needed to run before coming up with a perfect cube. In particular, a starting value of 9 will not terminate until a score of 125800 has been reached. Several entries realised that as the interval between each successive pair of cubes gets progressively larger, there comes a point when a method of speeding up the calculation is desirable. For example, a complete circuit of the board, scoring 280 points, can sometimes be added to one existing.

For an alternative method of solution please refer to my own solution on page 8 of *de la Vallée*'s issue.

Finally, a couple of corrections to July's *Miners and Muses*. The number of possible grids is 10^{24} — not 1000 as printed — not small either! About the intersection of the grid as given towards the end of the piece, should read:

In a Ball grid there are 14 six-digit numbers, 52 five-digit numbers, 54 four-digit numbers, 80 three-digit numbers, and 110 two-digit numbers. This makes a total of 208 numbers. Each of these can also be read in reverse, making 580 in all. Finally, there are 36 single-digit numbers, bringing the grand total up to 836.

Listings: 7

```
10 FOR N=1 TO 999
20 C=NNNN
30 R=C*(1/3)
40 IF R=N THEN PRINT N,C
50 NEXT N
```

1. *Journal of Management Studies*, 1995, 32, 1, 1-14.

```

1000 INPUT V
1010 R=V*(1/3)
1020 FL=0:FOR F=INT(R) TO INT(R)+1
1030 IF F*F*F=V THEN FL=1
1040 NEXT F
1050 IF FL=1 THEN PRINT "CUBE" ELSE PRINT
      "NON-CUBE"

```


Tandy Color Graphic Printer

This program is a screen dump for the Tandy Color-Graphic Printer, though it may work on other penplot/plotters. It uses all the colours and dumps sideways on the paper, in order to give the largest size. Any colour that is not available on the printer is shown as white. The dump is not solid colour, but made up of a series of minute squares, so saving ink in the pens. If your machine can take it then it is advisable to use the speed pot (PROM 8501010). (Remember you have been warned again using the speed pot — JG.) Even so while the screen is being dumped, it is advisable to leave it and do something else. A whole screen can take around 40 minutes, depending on the number of colour channels.

1. *Journal of Management Studies*, 1997, 34, 1, 1-14.

```

10 REM GET J.F. BORDGTON
20 REM JOIN TO MY FRIENDS
30 CLS
40 INPUT "ENTER PRINTER ON THEN ENTER ";
50 PRINT "Z, CHARGE"
60 INPUT "WHAT MODE IS THE PICTURE ON";
70 INPUT "READ MODE IS THE PICTURE ON";
80 INPUT "WHAT COLOUR SET IS IT ENTER";
90 INPUT "TOP LEFT CO-ORDINATES OF AREA
TO BE CUPPED (X,Y)";
100 INPUT "TOP RIGHT CO-ORDINATES OF
AREA TO BE CUPPED (X,Y)";
110 IF PRC OR PRX THEN PRINT "INVALID
ENTER, GO AGAIN";GOTO 100
120 IF CPT OR CPTX THEN PRINT "INVALID

```

[illegible]

Tandy 66E-115

This is a fast colour screen dump for the Tandy 525/525 printer. In the first part the foreground colour and colour set are defined by the user. In addition to this the user is able to choose the colour of the hardware

The main part is from line 179 onwards. These lines set the printer to graphics mode and select the drawing colour. As the printer paper is not wide enough to allow a double side screen dump the normal way, line 230 changes the X co-ordinate so the picture is drawn vertically down the paper. The screen dump enclosed took just over 2 hours.

[illegible]

```

20 IF (100) THEN GOTO 20, PENDING
20 PENDING 401
20 CLS
40 PRINT TAB(111) "COF=115 AND COLOR=CLAY"
50 GOTO 100
20 PRINT TAB(115) "R5454545, 443"
30 PRINT PRINT
30 INPUT "ENTER FORWARD COLOR (0-9) : " C
40 IF (C=0) AND (C=1) AND (C=2) AND (C=3) THEN GOTO
50 PRINT "411" SCREEN 0: GOTO 100
50 PRINT "41154545, 44355555 H45555555 COLOR"
60 PRINT "411" GOTO 100
50 PRINT "41154545, 44355555 H45555555 COLOR"
60 PRINT "41154545, 44355555 H45555555 COLOR"

```

[illegible]

Write: ADVENTURE

Peter Gerrard in a world of describable adventure!

NOW that our adventure program has reached the stage where it can interpret sentences typed in by the player, or at least break those sentences down into a succession of words and numbers that the program itself can use, we reach the point where we have to supply a vocabulary. In other words, we need to give the program a list of all the words that it's going to use and understand. By that I don't mean words like 'the' and 'is', or whatever, but those words that will enable a player to solve the game.

Such words as 'look', 'examine', 'open', and so on, should be common to every adventure, and in time to come we'll be programming those into our adventure's vocabulary. For now we need to concentrate on the ones that serve to distinguish one game from another, those that are particular to each individual program, and in order to do that we need to look very closely at our location descriptions.

Later on we'll be looking at ways of compressing the text so that we can get in as much detail as possible, but since the first description here has to be typed in at some point anyway, we'll start from there.



Sample Descriptions

Take the following, which comes from an adventure of mine. All you need to know is that you've been exploring an old mine, and you are approximately half way down a descending mine shaft: the outside world is still visible, since you are not yet that far underground. It goes something like this:

Up above you can make out the soil and the shaft, with a couple of stars twinkling as clouds scud by across your line of vision.

Further down, the shaft disappears into an inky blackness. Any stones that you dislodge fall for quite some time before hitting the bottom with a quiet crash. If you fell, you would probably make a slightly louder noise.

This is what we might term an 'interim' description, since there is nothing here for the player to do other than to go on or retreat. Nevertheless, those descriptions are important, and are quite considerably in adding to the flavour of the game. It isn't every location that can have a problem to solve, and no game should really be like that: you need to give the player some sense of progress as he overcomes a particularly difficult section. After spending day upon day struggling over something, it is very disheartening to move one location further on and be brought to a halt yet again!

Interim descriptions the player is told everything that he needs to know, but it does go slightly beyond the 'you are in an old mine shaft' type of thing that featured (and sadly still does feature) in many a game. In the latter there is no sense of atmosphere whatsoever, you are simply solving a set of problems rather than exploring a brave new world. However, by using just a few words to create a normal (and if we're going to compress things this doesn't make life any more difficult) we can give the player the true feeling of being there.

The line about 'If you fell, you would probably make a slightly louder noise' tells the player all he needs to know about the depth of the mine shaft (about in a humorous kind of way) without going off into rhapsodies and rants of 'purple prose', as people are fond of calling that sort of thing. Little details like the stars overhead, the clouds scudding by, all add to the description and the atmosphere produced by it. The player can really begin to imagine that he's there, rather than sitting in front of a computer solving logic problems.

Humour

Personally I think that humour is essential to an adventure game, provided that it isn't overdone. Of course, some games rely almost totally on humour and a penchant for terrible puns ('you are looking at a field of lambs, you feel sorry for them. Knowing that it is a couple of months time they're going to be taken away and slaughtered. They have panicked and lost' sort of descriptions), although I can't pretend to be overkeen on games like that (despite, as anyone will tell you, a liking for the pun). But a little dash of humour here and there never goes amiss.

And, like certain comedians, it is possible to be humorous without resorting to foul language, which some adventures regrettably do. There is no excuse for that sort of thing. By all means have 'water

word' detector built into your parser, because if people like to hope that sort of thing then they will do, and you can't grind out anything that is coarse or crude. You never know who might be playing the game.

So with all that in mind, and sticking to uncompressed room descriptions for now, let us get our player moving around in his adventure world.



Player movement

First of all, you need the room descriptions. For now, if you haven't got 64 such descriptions lying handy around, or you can't be bothered typing them all in, we can use a simple 'YOU ARE IN ROOM NUMBER' message, which at least will tell us that we are managing to move the player from one place to another, provided of course that we follow the message with the room number itself.

However, the way in which we could do that (44 PRINT "YOU ARE IN ROOM NUMBER CP"; GOTO 1000, where CP gives us the player's current position) is markedly different for the player to read (44 CH CP GOTO ... etc, where the dots would be replaced by line numbers indicating which line contains which room description, is just one way of doing it), so do let me see some code here so that we can later put the room description in there.

But the problem is, how do we get it over to CP? Like this, dear reader:

Let us assume that the player is going to start the game at location number one. At the start of our program, then, we would have a line declaring CP to be equal to 1. Then, we could have a group of lines like the following (this is also assuming that you're using the parser from our earlier column, although that's up to you of course):



I'd like to start off this month's Adventure Trail with a promise and an apology. First of all, I promise not to mention any sporting event ever again unless it involves Wigan and they've won! The time lag between my writing this and your reading it is such that anything I mention is listed in the mists of antiquity by the time it reaches you, and I've received a mild reprimand from a person who still remains nameless but knows who he is because he asked my brother Mike to pass the message on (hello there!) to the effect that he didn't have the faintest idea what I was on about. Many people say this, but the fewer the better and so no more sports.

Secondly, apologies to anyone who hasn't yet received the solution to an adventure. I'll be with you as soon as I can (or when I've finished this column). Sorry, lots.

But enough of this rambling, pass these wishes and let's get on to the trail of the Dragon.

Sad News

We Gerrards seem to have the power of life and death over magazines. No sooner do we mention one and it disappears forever. Insight bites the dust, so sad took it. Plan Dawson, and after a fleeting appearance in last month's column goes Adventure Contact. This is even worse than sad because it was produced in Wigan so commissions to Pat Winstanley. However, its sister magazine, Adventure Probe, is alive and well for the next three and a half years at least (or so I've said). Sandra Sharkey, editor, who's not beating me at post would love to hear from you at 78 Merton Road, Wigan, Lancashire WN2 6AT.

Better News

A letter from Joe Bonicat is always good news, since this man has solved more Dragon adventures than I have been written. With Joe being from Males we get an international flavour to the column (and races to come, with Gibraltar luring in the wings), so let's help my stamp collector and keep him coming.

In July issue of Dragon User the Expert printed Joels map of Total Eclipse, but suggestions include the key to the map. So, ever one to make friends, you'll find it

attached somewhere to this column. Ahh-hings! No you won't, I don't know if you're going blind or I'm going mad, but there's a perfectly good key in the top left hand corner of mine. Granted it's a bit faint. If we get six more letters, and we can find the original, we'll run the key again sometime. — Ed.)

Now completing the mammoth game is an incredibly feat of adventuring, but alas there are still problems. There is, for example, the abandoned craft, which nobody seems to have found. Salvage and invest won't work, so on behalf of adventures everywhere, HELP! the producers of the game, Fornat, are as elusive as the abandoned craft, so if anyone can help me and Joe please write in. Joe's address is 73 Anderson Street, Warrington. Make 28-08-87 and it'll be happy to help anyone with Total Eclipse (apart from the above writers, of course). Also, at the completion of Universe 1 the following words appear on the screen:

"Well done player/leader you have completed Universe 01. Place Universe tape 2 in player — prepare tape player — prepare tape player — press Enter when ready".

Where is Universe 2, this is the question. To quote Joe's letter "I will pay its value to whoever sends it to me first and when one day I've finished mapping it, he will be the first one to get the map". Okay you lot, now there's an offer you can't refuse. Incidentally, Joe's version of Total Eclipse was 1.3, so perhaps any later ones have a more easily found abandoned craft. Hopefully, we shall see.

Staying in this universe for a while, Donald Morrison is having problems with Syggy saying that when he enters the coordinates for the planet he gets transported into space. Well, are you entering the correct co-ordinates? These are 0-4-0-5, so enter that number then PRESS LEVER and he'll be and away you go.

Going onto parallel universes we arrive at Hazel Hemphreys and Graham Burton, who imports some words of wisdom concerning Operation Sappers. Antiquity "If I find antiques go south, east, east, east, then west in the 'green and brown'. Don't try to go further east when you find time-lost statues can be useful, take note of what the man in Aberdeen says". It must mean something! Of course it does.

Also, Graham is not on a par with the

Pope, and does make the odd mistake. Like leaving two of the machine code routines on the Ring of Darkness, thus making it impossible to solve. Ah well. Problems with some facts as well, so tomorrow you what the hair pin is not for picking the lock of the north door, you must enter the code, NOT go north, and then use the hair pin. As far as I can tell the aquarium is not essential to completing the game, so if I were you I'd make for that hole and continue from there; you'll find at least two more treasures by looking at the chest that you'll find there.

A plea for help from Paul Davies, of 4 Garthill Drive, Coombe, Shrewsbury, Shropshire, SY2 5JE. He's completed Testator, Sea Quest, Calyx Island, Jerusalem Adventure, Ultimate Adventure, Shewsbury and Syggy, and will help anyone who sends him an SAE. However, he also wants to know if there's anyone in the Shrewsbury area willing to sweep games. Okay Shrewsbury folk, getting on.

All right, all right, Ghorstar here we come. Andrew Powell, 1 Old Naval Hospital, Gibraltar, tells me, sends a letter that's a curious mix of grovel and truly varied threat. Grovel in the form of scolding (this is the stuff) and threat in the message that if I don't help him out he'll send the boys round. Why does no-one ever send the girls round, that's what I want to know (and several thousand letters of complaint). Anyway, the lad is stuck on Helios of the Ring. He's not the only one, so if anyone has a solution, Andrew and I would be pleased to see it. So would Graham Burke and a few others as well.

Having cunningly worked Graham Burke into the conversation, he is having a problem or three with Justapost, and reasonably near the start as well. Play on the lad, so making sure you've got something before you get there (like blue key card, sleeping pills and anything else you might find lying around after short-circuiting the robot) go to the monorial platform (and don't go in endless as done), wait for the car and board when the doors open. Get the camera from the photo gallery (only take food from the dinner dish when you need to eat). Close the entrance and put sleeping pills in the caretaker's coffee. Get the white key card and swap with caretaker and unlock the door. Get the beater mask, sticky tape and soldering iron, go back to the street

area and sold the rest out for yourself. That's more than enough together, you will in the game, I think.

Moving rapidly on to Norwich, where Nick Webb is a man lost without matches in Black Sanctuary. Well, no old son, by examining the mapstone in the cabin, and found behind, get a light, boy! No, but I've got it heavy room.

Despite everything, despite hints and tips in various columns, I am getting just as many letters about this game as ever, which means either that people are new to the column, or they don't read it, or they've just acquired the game. In order to stop dozens of you sending in requests for hint sheets, my postcard suffering heart failure and my printer ribbon being worn to a ... well, whatever it is that printer ribbons get worn to, here is the COMPLETE SOLUTION to Aqueduct IV. Don't read it if you don't want to know. It's presented in the order in which you need to do things, and comes courtesy of Michael Edwards of Blackmoor. Here goes...

1) From the very start, go D, E, N, E, S, E, N, N, D, E, D, D.

2) Play the (imperative deleted) bubbles game.

3) Find the memory GPOD and the MIRROR.

4) GO POSTER in the storage room (the mirror protects you against the laser).

5) FIX COMPUTER WITH GPOD then RUN COMPUTER.

6) Take plastic CARD (Go W, N, E. Take the BLASTER. Go W, S, E. Tell Huys-12 to FOLLOW ME. Go S, E. Drop the MIRROR.

7) Go to the fence field with Huys (if he follows following you find him and tell him to follow you again and tell him to GO NORTH through it. Go N, W, S. Take the FLASHLIGHT. Tell Huys to follow you.

8) Go to the tool chest. Open it and look at it twice. Take both items that you find there.

9) Go to the sliding door. OPEN DOOR WITH CARD then GO DOOR. OPEN BOX WITH CROWBAR. Look twice, drop the crowbar and take the AIR HELMET.

10) Go to the (imperative deleted) robot game. Go N, D. LIGHT the FLASHLIGHT then P. Do past more robots. OPEN DOOR WITH CARD then U, S, U. UNLIGHT FLASHLIGHT then DROP CARD.

11) Find Huys and go to the hatch. Open hatch, tell Huys to follow you (he MUST keep following you) then GO HATCH.

12) Find the mutant. SHOOT him then drop the BLASTER. Go W. Find the box downstairs and take the sawed with the plant cutters. Drop the cutters then find the

caves, and remember Huys must be following you.

13) Go in the caves. Light the flashlight and go S, E, E, N, W. Take the MUSHROOM and go U. Unlight the flashlight. Find the module and battery to LEFT MODULE.

14) Take the module. Combine the SERVED with the MUSHROOM to make a radiation pill.

15) Return (you don't need Huys now) to the base, remembering to UNLIGHT FLASHLIGHT when you don't need it.

16) Go past the security robots, N. D. LIGHT FLASHLIGHT, N, D. EAT the PILL. GO DOOR then FIX REACTOR WITH MODULE. Return to the poster room, get mirror, go to the poster, M. PRESS BUTTON and ... END!!!

Huys-12's message is:

To save the director you must:

1) Make a radiation vaccine.

2) Fix the reactor.

3) Press the button.

Signed ... Huys-14

Right, me again. No more letters about Aqueduct IV, okay sharp and sharp-witted? See you next month.

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Odd One Out

When Gordon Lee gets going, he goes one and one and one

QUESTION: Which of the following is the odd one out?

7 788 300 200 300 400 500 600 650 700 750

Keywords: *Age, Attitudes, Family, Gender, Health, Inequality, Life course, Migration, Social capital, Social networks, Social support, Social structure, Social well-being, Well-being*

End of mathematical part and on to some lower numbers

Consider that series of numbers, which are made up of the same digit repeated a specified number of times. These are known as 'monodigit' numbers, and particularly, much interest has been shown in repetitions of the digit '1' — the term 'repand' being used to describe numbers of this type, and it will be those that we will be examining here.

For convenience, we can use a type of algebraic shorthand to refer to these numbers, using the form A_y , where y denotes the number of ones present. So, for example, A_1 will denote 11, and A_{10} indicates 1111111111.

factor in determining their factors, and in particular discovering which of the primes in prime R_n is obviously prime, but the next prime immediately after the primes is not reached until n . The numbers in the numbers are all composite, but establishing that factors is not all that easy. For example, when the modulus R_n already contains a factor of n , then the numbers R_n and R_{n+1} are both composite, and if you don't believe it, just multiply them and see! The only other reasonable low result which is known to be prime is R_n after which R_n is the prime for n plus less than R_n . Enigmatically, there are large gaps in the knowledge about these numbers. Most of the primes have been proved to be composite although in many cases the factors themselves have not been established.

An associated problem involving resources is as follows:

Take any prime-number p , and find a value n , such that the product of primes $\leq n$ is congruent (mod p) to 1. As a simple example, the prime 3 divides $n!$ and divides 22 with value

is 111. Classify this is impossible for the two primes 2 and 3 (can you see why), but at the least such a value exists for n , although this number may be exceedingly large!

The table shows the factors required for all primes except 2 and 3, under 108. The number in column y indicates the number of times in the final product — i.e. the value of y in the formula xy . Of particular interest are those primes marked with an asterisk. With these, the value of y is one less than the prime listed. Mathematically, for this to happen, 10 has to be primitive root of the prime in question. These numbers turn up in different guises if we wish to evaluate the reciprocals of primes. Except for 2 and 5, all primes have reciprocals with digits which repeat in order.

For example, $6T = 0.142857 \dots$ and so on to infinity. This cycle of six digits is reflected in the γ column of the table, where, except for the prime 2, the column indicates the number of digits in each order.

[illegible]

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

1. *Journal of the American Medical Association*, 2000; 283: 2689-2696.

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

The competition question this month is concerned with the prime 34543. What we want to know is the smallest number by which we can multiply 34543 in order to obtain a product containing *exactly* one zero. Now, as 10 is a primitive root of 34543 this product will contain 34543 zeros, and consequently the number that we are after will be almost as large. So all that we need is the ten digit sequence which occupies all positions twenty thousand and one to twenty thousand and ten.

Meanwhile, the number itself has 34537 digits — commencing with 32989492817 and ending with 8772379377.

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[illegible]

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To make everything easier (no, you can't leave the solution out), please complete the feedback. The more we know, the more we can do for you. And send it to us with your solution.

References

Lots of entries. We didn't reject people who used the "leading one" as long as they had the other answers right. Grading may have something to say about that eventually — some of the entrants can think that. The winners are:

John Machin of Troon, Ruth David of Croydon, Richard Long of Cambridge, Jake Anderson of Edinburgh, David O'Duffy of Cambridge, Phil Gallagher of Stafford, R. Raine of Exeter, Paul Weldon of Wotton-under-Edge, Dave Laxton of Rutherford, Fred Taylor of Middlesbrough, Austin Henderson of Exeter, Graham Barber of Sutton Coldfield, R.R. Greenard of Ingleston, Terry Patten of Chesham, Phil Davies of Loughborough, Andrew Powell of Cambridge, John Matthews of Preston, Alan Thomas of Shiphampton, Clive G. Boyd of Ashford and C.J. Gray of Middlesbrough.

And the mythical price, kindly donated at short notice by small but devoted non-profit waste house **Bioswastoff**, is a set of free vouchers and a set of discount vouchers. Thank you, Andrew. The free vouchers will go to the worstest programs, and the rest to the sunnier-up, life aren't going to announce who is who here — all the answers seem to be a high standard of entry.

And some very silly (and even poetic) tebreakers) which gave us lots of laughs. Favourite from Olive G. Scott: "There was the days. Why, when I was seventeen, computer programs had to be saved on six cylinders." But there were lots of other good ones.

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

These responsibility evaluations appeared on page 209.

The Answer

This is Gordon Lee's own solution to the June competition see page 28 for results

ANSWER: There are two numbers which will produce the longest sequence possible (of eight steps). These are 808 or 888.

```
8088 (= 808 * 10)      8888 (= 888 * 10)
8883 (= 88 * 10)      8883 (= 888 * 10)
8828 (= 888 * 10)      8823 (= 888 * 10)
8203 (= 808 * 10)      8233 (= 888 * 10)
8203 (= 88 * 10)      8237 (= 834 * 10)
8028 (= 84 * 10)      8278 (= 834 * 10)
8288 (= 840 * 10)      8788 (= 884 * 10)
8808 (= 824 * 10)      8888 (= 884 * 10)
8881
```

Solution: The program begins with all starting values in the range of 108 to 888. These are held in the **FORNEXT** loop at line 110. For each test, this value is transferred to variable 'X', and it is on this variable that the operations are performed. Loop 'Q' at line 140 appends each digit in turn, and the result (in variable 'Z') is tested for divisibility by 8. If an exact multiple is found, the value currently in 'Z' is transferred to variable 'Q'. This variable 'Q' is set initially

to the value of line 130 and if it remains at -1 when tested at line 180, then no multiple has been found for the current sequence under test. However, if a multiple is found the new number is generated at line 190, and the right-hand three digits are extracted at line 290 by means of a string variable. This is then converted back to numeric variable 'X', and the whole process is repeated from line 100. A 'count' is kept of the number of steps possible for each of the starting values, and this number is checked against the current maximum at line 205.

If the program is run, it computes this maximum step as being 8. It is then necessary to re-run the program a second time, having amended line 288 to read:

```
280 IF T=8 THEN PRINT S
```

Line 280 should also be deleted. This second program will then print those starting values for which a step value of 8 has been achieved.

```
180 MAX=0
110 FOR S=108 TO 999
120 X=S: T=0
130 Q=-1
140 FOR D=0 TO 9
150 Z=X*10+D
160 IF 1/17=INT(1/17)
170 THEN Q=D: T=T+1
180 IF Q=-1 THEN 250
190 X=X*10+Q
200 XS=STR$(X):
210 XS=RIGHT$(XS,3)
220 X=VAL(XS): GOTO 110
230 NEXT S
240 PRINT "MAXIMUM"
250 STEP="": MAX
260 END
270 IF T=MAX THEN
280 MAX=T
290 GOTO 220
```

Communication

Problem: Where can I obtain a program in Basic to rotate images in X-Y-Z planes, the points being obtained from an array in Pts. X-Y and Z in high resolution? Help.

Name: Dave Bennett

Address: Radcliffe House, 8A, Daresop Lingard House, Germany.

Problem: I need to connect my TRS-80 DMF 100 Printer to my Dragon. Is there a suitable interface?

Name: Chris Vollerstein

Address: 118 Alpine Rise, Styvechale Grange Estate, Coventry, W. Midlands CV5 8NR.

Problem: Does anyone have the cassette version of Empire by Shards Software which they are willing to sell?

Name: Karen Carpenter

Address: 41, Glenview Road, Colinsale, Co. Londonderry, N. Ireland.

Problem: Disparate Fonts: Pulling out of line. Near to serious breakdown type faces. To borrow, buy or even a temporary swap, look at a copy of The Advanced Programming Guide for SelfDOS book. Very nice the

manual which accompanies Morris's Pascal Computer Also 787 Flight Simulator manual. Original publishers have none left, and mine have been stolen. If anyone photocopying facility and will pay of postage and packing.

Extending desperate for a good on-disk DragonDOS cartridge

Name: Paul J. Reed

Address: 7, Fairview Avenue, Whitstone, Leicester LE8 3AG.

Problem: Does anyone have a Dragon's Claw interface (and possibly a Snapcam and software) that they are willing to sell or lend?

Name: Andrew Bell

Address: 7 St. Pauls Road, Cambridge

Adventure Contact

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon User Adventure Helpline.

1213 Little Newport Street, London WC2E 8PP. As soon as enough entries have arrived, we will start printing them in the magazine.

Don't worry — you'll still have Adventure Trust to write to as well!

Adventure

Problem

Name

Address

Adventure Contact

Adventure: The Kat Trilogy
Problem: How do you get past the combat?

Name: Paul Dean

Address: 26, Millhouse Drive, Wyms Brook, Chesham, Glos. GL50 4RG.

Adventure: Ring of Darkness

Problem: How to board the cat,

also how to get the tag home to join.

Name: Aiden Davies

Address: 33, Norfolk Street, Finchley, London N11 7HG.

Adventure: Spyder

Problem: I have found the transporter and co-ordinates.

How to use the transporter?

Name: Alison Williams

Address: 33, Mayflower Drive, Isleford, N. Wokingham, Chyod LL10 8LD.

Adventure: a) Sheranigara b)

Crimblewood Incident

Problem: a) How do you safely

cross the rainbow? b) Which command allows you to board the boat?

Name: Chris Vollerstein

Address: 118 Alpine Rise, Styvechale Grange Estate, Coventry, W. Midlands CV5 8NR.

