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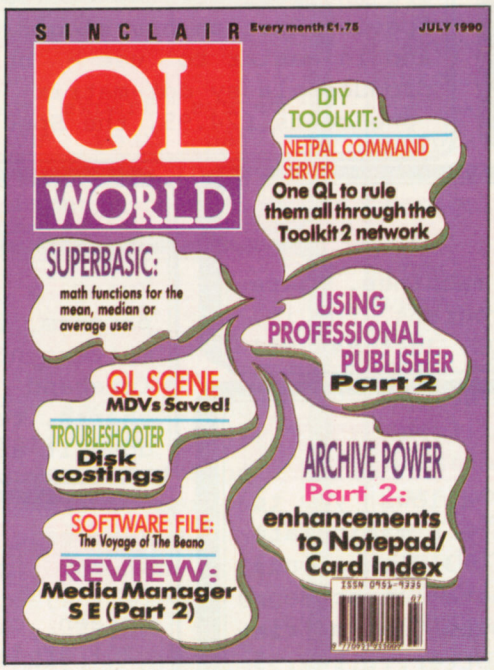

NEXT MONTH

DIY TOOLKIT MULTIBASIC

Part two of the March article, completely revised.

DATING ARCHIVE

Get control of your Archive date formats.

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PC CONQUEROR

PC Conqueror addresses and answers the problem of IBM PC compatibility faced by many QL users. Boot up your QL with PC Conqueror, and under 10 seconds later your QL will be a pretty compatible PC! This has been accomplished by our very meticulous and painstaking emulation of the functionality of a PC clone, down to the very operation of the 80x86 family of microprocessors! But you do not need to concern yourself about how we've managed it - Conqueror works. It can read, write and format PC disks, run PC operating systems (including MS-DOS and DR-DOS, also Unix-clones + p system), move data QL<->PC and can multitask. In a full review in the May issue of QL World PC Conqueror was found to be very compatible - "every program I tried with Conqueror worked satisfactorily". On the subject of speed, QL World found Conqueror clocked in on average at 60% of the speed of a PC, even without user-tuning Conqueror's performance (a feature we put in for knob-twiddlers!). The price is £89.95, and add another £50 in order to get MS-DOS v4.01 too.

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ProPub is the state of the art QL QL desktop publishing system. It can handle user-input text and drawings in a huge variety of fonts, sizes and styles, as well as import from Quill, Editor, Eye-Q etc. This is a very user-friendly DTP program - most of its controls are intuitively obvious, but there is context-sensitive help available at every stage. Pixel proportionality, configurable space allocation between characters + words, honouring of bold/italics/ underline (+ other embedded commands) in the source text, word-wrap (text boxes can be of ANY shape), v.easy shadowing/brushwork and a detailed manual all combine to make this a spectacular system, ideal for pros and beginners alike.....£89.95

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This ProPub accessory enlarges fonts (80+ with Lightning SE, 20+ with ProPub) to sizes of your choice without any jaggedness.....£19.95

SOLUTION WITH MS-DOS
SOLUTION

Solution is a pretty compatible PC Emulator, about half the speed of PC Conqueror. If you are on a tight budget, it is a snip at £39.95 or just £89.95 including the full MS-DOS v4.01

SPECIAL DESKTOP PUBLISHER
DESKTOP PUBLISHER

If your purse cannot stretch to ProPub, these are the best desktop publishers for the QL. The Special Edition has bigger fonts, more features and is easier to use - but both allow you to produce classy dot-matrix output. The standard one costs £24.95, the Special Edition £39.95.

SUCCESS CP/M EMULATOR

CP/M was a popular O/S for Z80 machines. There are 1000s of good, cheap PD programs for it, which Success lets you run on a QL. Just £49.95!

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SUPERCHARGE BASIC COMPILER

Supercharge is half the speed of Turbo and lacks many of Turbo's advanced features. A budget buy at £29.95, though. The quality is excellent.

PERFECT POINTER TOOLS

This excellent program gives you an on-screen pointer (arrow) environment and all the tools you are likely to need to run it. Run your QL this way now for just £29.95!

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Few users actually require all the facilities of a sophisticated database like Archive. QFlick presents a very convenient alternative - a very fast card-file database, with easy to learn snappy search and navigate commands and good file-handling. You can move Archive data to/from QFlick, and run multiple copies of QFlick in the background. A good buy at £29.95

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LIGHTNING SPECIAL EDITION LIGHTNING

Lightning Special Edition is a program which will make your QL run over twice as fast as normal, with no side effects. It will give your machine a professional - and very new - feel to it, as things will happen quicker, screen ouput will be snappier, internal computations will be faster. Lightning SE does this quite automatically - no particular knowledge or skills are required by you. The program installs itself on your boot-up cartridge(s) or disk(s), just like a benevolent virus. When you then boot up your QL, Lightning SE auto-installs itself. Thereafter all you notice is very increased operating speed on the part of your QL. Lightning also adds many new commands to the QL's repertoire, including new types of scrolls, the facility to change fonts, colours etc in existing programs (Quill included!) and lots more. It is a magic wand you must not afford to be without! A cut-down standard version costs £24.95 and the super full-speed, full-function Special Edition costs just £49.95: it is the best program ever for the QL, bar none.

MONITOR

Monitor allows you to trace the operation of machine code programs as they run. Breakpoints can be set. A snip at £19.95!

DIGITAL C SPECIAL EDITION COMPILER
DIGITAL C COMPILER

Std Digital C (£29.95) is a high-speed C compiler. The Special Edition (£49.95) is even faster, and has structures, long pointers/integers, no 64K size limit, direct QDOS access, separate QL/C libraries.

GAMES COMPENDIUM
BACKGAMMON
DROIDZONE
BLOCKLANDS
REVERSI
ARCADIA

Backgammon is a friendly companion, Reversi a powerful and intelligent adversary well versed in alpha-beta search methods. Blocklands sets you free in a 3D world measuring 256x65536 QL screens. Droidzone is a zap-em-up game faster than any other. Arcadia is a 2 in 1: BMX Burner reminds one of JetPac, and GridRacer is like nothing else! Each game is £9.95: £29.95 buys the lot

NEWS

* There are five new programs in our stable - Toolkit III, QFlick Card Index System, QKick Multitasker, Disktool with Quickdisk, and Perfect Pointer Tools - all created by Ultrasoft.
* Our non-game programs are very comprehensively documented with A4 manuals averaging about seventy pages in length (the largest is 325+). They are 4-hole punched for easy binding/ storage.
* Microcartridge users please note: don't panic! we have large stocks of microcartridges and we are NOT going to run out. Quality software on cartridge will continue to be available from us for the foreseeable future. You can buy cartridges from us at the rate of £19.95 for a set of five cartridges.

SUPERFORTH COMPILER

Superforth is a beautiful FORTH-83 compiler for the QL. It produces stand-alone, very fast FORTH code which you can EXEC or EXEC_W: the official specification for the language is very greatly exceeded. FORTH is a very rewarding language to learn, and the supplied manual is a a complete tutorial for FORTH, assuming no knowledge at all and taking you through FORTH one step at a time. The whole Superforth system will cost you £39.95.

TRANSFER UTILITY

If you have a disk system but still have programs on cartridge that assume mdv is the device name, this program will move them across without hassle. Damages only £9.95!

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Microbridge is a good standard Contract Bridge bidder, player and master tutor, providing non-intervening opponents as well as a partner well-versed in Acol. It can show its reasoning for bids on screen 4-5 lines of conversational English! The program doesn't cheat (each hand is managed independently, making deductions from bids and play just like humans).....£34.95

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MEDIA MANAGER SPECIAL EDITION
MEDIA MANAGER

MMSE is a joy to use. Whether something has gone wrong with a disk or tape ("Not found", "Not a valid Quill file", "Bad or changed medium", "Read/write failed" etc) or whether you want better control over your programs and data, MMSE should be to hand. Virtually any calamity can be recovered from automatically: all permutations (accidental deletion, partial overwriting or formatting, errors yielding: bad map but OK directory, bad directory but OK map, bad map and directory, OK map and directory but bad file sectors, unknown fault, power glitch corruption and so on) have been catered for. It isn't just for when things go wrong, either - many useful utilities are included. MMSE costs just £49.95, or £24.95 for a cut-down std version that is less friendly.

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QL SCENE

Miracle Vs PDQL

Miracle Systems Ltd. and EEC Ltd. are applying for a High Court judgement against PDQL for debts going back "about a year", according to Miracle's Stuart Honeyball. *QL World* understands that some payments have been made under an arrangement between PDQL and Miracle Systems, but that other payments have not been met. Bill Richardson at EEC confirmed that EEC were joining the action through Miracle Systems' solicitor.

In recent weeks *QL World* has received a number of complaints about non-delivery of goods or lack of response by PDQL to queries from customers, some going back a number of months; in some cases letters confirming deliveries have also been received subsequently. Individually the complaints have involved fairly minor matters, but collectively they have given rise to concern because PDQL's reputation as a reliable supplier of useful programs is well established.

Users have also reported that proprietor John Silk seemed to be rarely answering the phone and that visitors during office hours have found the door of PDQL's Birmingham industrial unit locked, and have not been able to contact him. However, *QL World* got through to him on the telephone after a couple of tries — not unusual for a business with no on-site assistant. Asked about his relationship with Miracle Systems, John Silk admitted that he had 'missed a payment' under the arrangement with Miracle, but that he thought that a resolution would be reached by the end of the week (19th May 1990). However, Stuart Honeyball denies that an agreement was in the offing. "That is what John tells everyone" he said, "but we are applying for a High Court judgement.

He also blamed the falling QL market for drawing his attention to other areas of business, delaying his response to some queries. An Irish user who had not received of a 3.5in disk drive ordered in January 1990 would receive a refund shortly, he said. "These are bare disk drives and I am waiting for them to be boxed," he told *QL World*. The order was placed in January and advertising must have been placed at least a month earlier. Had he been waiting for six months? "Yes".

PDQL was started mainly as a vehicle for programmer Chas Dillon's software, which has a considerable reputation for quality among QL users. However, QL World understands that Chas Dillon and John Silk formally parted company as business associates in early 1989.

QL Standards

Belgian Yves De Billoez is circulating a letter to many QL software and hardware manufacturers in Britain and Europe in the hope that they will co-operate in establishing an "institution for defining values and system organisation of QL-based computers", to be named ESOQL (European Standards Organisation for Quantum Leap).

The aim of the institution is to provide "an independent bureau which can inform people concerned with new soft and hardware development on QDOS-oriented computers. A complete definition enlarging QDOS will result."

Hoping to model the institution on an information-exchanging group such as Quanta, De Billoez names several factors which he believes should apply to future software development. These include multi-lingual programs (as far as possible), standardised menu-screen for better integration of software packages, and named standards which will help programmers produce software which is compatible with all of the major system versions and add-ons.

De Billoez is ready to undertake work in certain areas and is hoping for the co-operation of as many knowledgeable QL suppliers and users as possible. He believes that setting institutional standards would raise the cost of software development, but would nonetheless benefit everyone by guaranteeing compatability.

For further information, please contact **Yves De Billoez at Cretenborchlaan 17, 2750 Beveren, Belgium.** He is expecting to have a modem installed shortly.

Mdvs Still Alive

Ablex, manufacturers of the QL microcassettes, have confirmed that the presses are now rolling again and that microcassettes will be available by the time this news item reaches publication.

"Production re-started a few days ago," MD Peter Banks told *QL World* on 17th May. "We are going slowly at first, and when things are a bit more sorted out, David MacSorley, our Production Manager, will be ringing around the regular customers to find out who wants to order and how much." "Then we will have a clearer idea of when and where they will be available.

Banks hinted that Ablex might decide to supply small orders directly, but this was clearly some distance in the future and depended on the scale of demand.

The Microcassette was declared to be on the verge of extinction earlier this year as sources of the special grade of recording tape needed for the mdvs seemed to run dry and supplies of cassettes to small as well as larger users became exhausted.

Now it looks as though the Microcassette has a future, but in the meantime many QL users have taken the opportunity to upgrade to disk.

Clock

News has just reached us of a new hardware device for the QL. The battery-backed real-time clock fits into the QL rom port and maintains the QL's time when the power is switched off. "The important thing about the clock" says maker Phil Gaskell "is that it is totally uncorruptible by the QL switching on and off." The cased device includes a separate eprom socket so that the rom port is not monoplised by the Clock.

The device costs £29.50. Enquiries to **P L Gaskell, 16, Tennyson Rise, East Grinstead, W. Sussex RH19 1SQ.**

OPEN CHANNEL

Open Channel is where you have the opportunity to voice your opinions in *Sinclair QL World*. Whether you want to ask for help with a technical problem, provide somebody with the answer, or just sound off about something which bothers you, write to: Open Channel, Sinclair QL World, 116/120 Goswell Road, London EC1V 7QD.

Recovery

I read with interest the letter sent by G.M. Young – October, 1989 – regarding the recovery of Archive files by replacing the lost "v". I have been using this trick for the last two years since I bought a Thor and found the filed utility among the free items. The trick works wonders, but beware – although the file opens and closes and can seemingly be manipulated as if nothing had ever been wrong, there are now two nasties tagging along. There may well be more but these two I have managed to identify and they appear to work hand in glove with one another, as I have found to my grief on two occasions.

The first one is the dreaded "End of file error . . ." at least this one identifies itself, which appears at a time of its own choosing and for this there is no cure. I think replacing the "v" only lets the Start Of File agree with the information held in the FAT, so *Archive* opens it as if it did not really care where the End Of File was.

And so, on to the day when you are busy minding your own business Archiving and the screen goes blank and you are confronted with the frightening "Arithmetic Overflow". Again it is too late; there is no recovery from this; the machine hangs and all that is left for you to do is pull the pin and start again. The fault is that your file is bigger than it thinks it is and your memory is swamped. I managed on one occasion to re-open the file after this happening but I was allowed to look only at the first 18 records or so, and the machine locked up again.

If you lose a file and manage to re-open it – giving it a logical name – with the "v" trick take the following damage control action immediately:

Do not close the file
Do not alter the file

Create a duplicate file (now is the time to add or dump fields you need or don't need); use the LET command o transfer the records to the new file, i.e.

```
proc txfer
all "a"
  let b.c$=a.c$
  let b.d$=a.d$
  etc.
  etc.
endall
```

Close both files, and kill the corrupted one.

G.M. Greene,
Jeddah,
Saudi Arabia.

Editor's notebook

WE HAVE taken two more steps towards recovery from our late shake-up this month: Simon Goodwin is back with DIY Toolkit, and a new, improved Microdrive exchange has just hatched out and is sitting — cheeping loudly — in the middle of a nest of paper work, waiting to be fed with programs. This month we have a handful of MDX classics back on the menue, next month we should have the whole list reinstated, with prunings, and then some new programs should be ready to serve.

Most importantly, at last we are able to supply programs on disk, and in due course this will mean that we can supply material which would have been impractical on mdvs.

We also have three 'part twos' — one of a new series, one second part of a major review, and a revitalised second part of Using Professional Publisher, which appeared in an imperfect state on the tail end of Part One during our late troubles in the April issue. Next month we should have a completed and updated version of MultiBasic, last seen in the March issue.

The telephone is still in the skip, but everything else is falling into place.

Psion

I am experiencing a great deal of difficulty getting my Psion Organiser and QL to communicate efficiently with each other and wonder if any readers have had similar problems they have overcome. I have a QL which I bought from Dixons – it is an AH rom – and recently acquired a XP Psion with the intention of collecting data on it for downloading at intervals on my Archive database for analysis as well as for long-term storage.

I obtained from Transform Ltd its *QL-to-Organiser* software to transfer files from one machine to the other. It is simple to set up the transfer of data but it is always difficult to achieve.

The first problem is that the first field of the first record always lacks the first two characters of the field. The second and more frustrating problem is that the data transfer is frequently interrupted by an error message:

Job 1 boot Line 3780 INKEY$
Xmit error
Retry Y/N

This error message appears at apparently random points during the data transfer and pressing Y occasionally works in re-establishing contact between the machines. More often than not, however, some fields are lost and the rest of the data transferred is valueless, as it is allocated to the incorrect fields of subsequent records.

I have been in touch with Transform about this problem but so far it has not identified a fault in the software and suggests that my QL is to blame. In the hope that some readers also have a QL, a Psion Organiser and Transform software and have experienced similar problems, I seek help.

R.J.R. Goodall,
Thorn Lea,
Upper Brockholes,
Halifax,
West Yorkshire HX2 8XG.

Editor's comment: It could be the ROM which is causing the problem. Can anyone with a similar QL shed any light?

Merge

For the first time since I've been programming, I actually needed to write a SORT routine. Not content with an old fashioned 'bubble' sort, I recalled a concept I'd heard about once before — a 'merge' sort. As this is not something I recall seeing in *QL World*, and

as it introduced the technique of recursion — which I have also never used before — I thought I might share the results of this effort with your readers.

The general theory is that it is easier to merge two pre-sorted tables than to sort one, so if you can split your table in half and merge the two halves together the job will be done much quicker. This is fine in theory, but the two halves need to be pre-sorted. How can you do this?

The trick is in using the program you are in to do the pre-sort of each half. With SuperBasic, it is possible to do this and is called recursive programming.

In this program, you keep calling yourself using half the previous table until you are left with only two entries, which are then merged. As you then return back up the chain, you have two small, pre-sorted halves which can be merged together before passing control back up to the next level which then merges those two, larger, 'halves' and so on; back up to the level you started on.

The resulting code is surprisingly compact, as you will see below.

An important point to note is that all your control variables *must* be defined as *local*. This includes the temporary table which stores the merged data before copying it back to the original area. The reason for this is that you will be using the same variable names as the next level up (you have to — it's the same piece of code), so you must keep your own copies.

This particular procedure was designed to sort a table called filetab$ which could be any number of 30 byte entries, ie DIM filetab$ (any,30).

To use it, you would say simply "SORT first,last". 'First' is the first entry you want sorted and 'last' the final one. If the table is not full, 'last' should be the last one actually entered because the null entries included in the range will get sorted to the front.

For example:

```
10 DIM filetab$(50,30)
.
.
50 SORT 1,45: rem sort first
45 entries, leaving the last 5.
```

Important variables are:

f	sort From this entry
t	sort To this entry
t2	To end of 1st half of table
f2	From start of 2nd half of table
f1	with f2, pointer to next entry to be merged from each half :merge phase).
temp$	table to temporarily store merged items. Note it is automatically dimensioned to the right size.
i	general control variable, used as index to table$.

```
20000 DEFine PROCedure
      sort(f,t)
20010 LOCal temp$(t-f+
      1,30),h,dif,f1,f2,t2,i
20015 REMark ★★★ Find
      half way point in table
20020 dif=t-f
20030 h=INT(dif/2)
20040 t2=f+h : f2=t2+1 :
      f1=f
20045 REMark ★★★ If
      either half of the table
      contains more than
20047 REMark ★★★ one
      entry, sort that bit
20050 IF t2>f : sort f TO t2 :
      END IF
20060 IF f2<t : sort f2 TO t :
      END IF
20070 REMark ★★★★
      Merge 2 halves of
      table to temp$ ★★★
20080 FOR i=1 TO dif+1
20090 IF f1>t2:temp$(i)=
      filetab$(f2):f2=f2+1:
      NEXT i:EXIT i:END
      IF
20100 IF f2>t :temp$(i)=
      filetab$(f1):f1=f1+1:
      NEXT i:EXIT i:END
      IF
20110 IF filetab$(f1) <
      filetab$(f2)
20120 temps$(i)=filetab$(f1):
      f1=f1+1
20130 ELSE
20140 temp$(i)=filetab$(f2):
      f2=f2+1
20150 END IF
20160 END FOR i
20170 f1=f
20180 FOR i=1 TO dif+1
20190 filetab$(f1)=temp$(i):
      f1=f1+1
20200 END FOR i
20210 END DEFine
```

I hope your readers find this of some interest.

Neil Taylor,
Taylor Made Systems Ltd.,
Walton-on-Thames,
Surrey.

Indexer

I have some comments about *Indexer – QL World*, February, 1990. I would like to compliment John Watson on his very useful program. I would like to suggest some small improvements concerning the use of channels. To have the possibility of choosing between the screen, the printer and a file he defined the procedure "choose".

Independent of the choice made, he uses channel number 2 for the output. This causes me a small problem; after having saved an index and trying to print the index on the screen, I get the error message "channel not open". To avoid this I have used the following modifications:

In line 1080, modify in:chan=4:filesave

In line 1100, modify "PRINT#2,k$" in "PRINT#chan,k$"

In line 1110, add :IF chan>2 THEN CLOSE#chan

In line 1665, add IF chan=3 THEN PRINT#chan, CHR$(27) &"1"&CHR$(5):REMark for EPSON FX-80 left margin at 5

In line 1800, modify "PRINT#2,t$" in "PRINT#chan,t$"

In line 1860, modify "PRINT#2,t$" in "PRINT#chan,t$:IF chan>4 THEN CLOSE#chan"

IN line 2260, add :chan R 2

In line 2360, modify in: IF k$="P" THEN chan=3:Open#chan, ser1:EXIT query

In line 2435, add IF chan=3 THEN PRINT#chan, CHR$(27) &"1"&CHR$(5): REMark for EPSON FX-8 left margin at 5

In line 2510, modify in: PRINT#chan,k$

In line 2539, add :if chan#2 tehn close#chan

In line 2635, add DELETE 'mdv2_'&text$&'_exp'

In line 2640, modify in: OPEN_NEW#chan, text$&'_exp'
In line 2660, add :'on drive 2.'

Martin van der Jagt,
Apeldoorn,
Netherlands.

Names

The following short Basic program can be used to amend EXECable files to give the jobs names when running as described in the Qdos specifications. Using this program, programs such as *Spellbound*, Quill and the other Psion packages can be named. This aids easy identification of jobs in the list given by the TK II command JOBS – and allows use of commands such as RJOB Quill instead of having to supply three numeric parameters. The program requires TK II but obviously is of little value without it.

The program lets you save the new version under a different name from the original, working on the premise that it never hurts to try it first.

The program assumes TK II is active:

```
100 REMark Program to name
    Jobs R Goodwin 1988
110 PAPER 0: CLSREPeat
    In_Name
120 INPUT 'Input filename:
    ';A$
130 IF NOT(FOP_IN
    (#4,A$)) THEN EXIT
    In_Name
140 PRINT 'Cannot open file';
    DATAD$;A$
150 END REPeat In_Name
160 IF FTYP(#4) <>1 THEN
170 PRINT #0; 'Not Complete
    – Not EXECable';CLOSE
    #4:STOP:ENDIF
180 BGET #4 5,a:BGET
    4#,b:IF a*256+b=HEX
    ('4AFB') THEN
190 PRINT #0; 'Not Complete
    – Already Names'CLOSE
    #4:STOP:ENDIF
200 1th=FLEN(#4)
210 Dta=FDAT(#4):CLOSE
    #4
220 INPUT 'Name to give
    Job:':B$:g=LEN(B$)+8+g
230 St=ALCHP(1th+LEN
    (B$)+10+g)
240 LBYTES A$,St+1-+
    LEN(B$)+g
250 POKE St,HEX('4AFB'):
    POKE_W St+8,LEN(B$)
270 FOR F=1 TO LEN(B$):
    POKE St+(F,CODE(B$(F))
280 INPUT 'Save to file: ',C$
290 SEXEC C$,St,1th+LEN
    (B$)+10+g,Dta
300 RECHP St
```

R. Goodwin,
Guildford,
Surrey.

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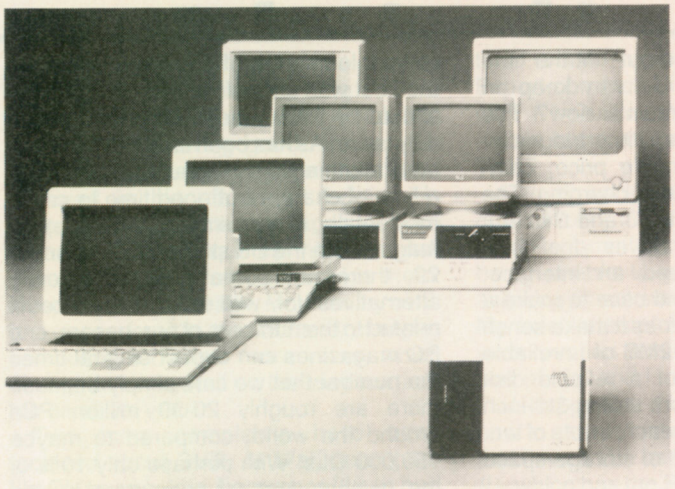

Pico 800 uninterruptible power supply.

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Breaks in the mains power supply are the enemy of all computer users, whether they are inherent or caused by the use of other electrical equipment in the building, and the result can be a devastating loss or corruption of data. A defence against these threats is available to all pc users with the compact low-cost Pico series of uninterruptible power supplies from Victron (UK) Ltd. The Pico comes in 400W and 800W versions and provides a constant source of clean and stable power. In the event of a complete mains failure the Pico automatically switches to the back-up batteries to maintain 240V ac power, sounding an alarm.

There is no need for immediate system closure, however, as, for instance, the battery back-up of the 400W version can support one pc and peripheral for up to two hours or three pcs (including one 40MB hard disk) and three peripherals for up to 20 minutes, while the Pico 800 will support up to five pcs. Warning of battering exhaustion is given by a further alarm and extension packs are available.

The Pico 800 has automatic load sensing which switches the unit off once it detects that the computer or other equipment connected to it has been turned off. This prevents the unit switching to battery back-up with consequent drain on the battery if the system is inadvertently switched off or disconnected at the mains wall socket.

While computers are the main sufferers from unstable power supplies, the Pico can also protect other communications equipment, like faxes and telephones, against mains failure. In common with all Victron ups systems, the Pico has a two year warranty, is extremely reliable and is protected against short circuit and overtemperature. **Contact Victron (UK) Ltd., Jacknell Rd., Hinckley, Leics LE10 3BZ. Tel. (0455) 618666 for further information.**

Guideline

The Data Protection Registrar is again reminding people that any computer database containing information about members of the public above a certain bald minimum and/or for anything other than private and individual use must be registered under the Data Protection Act. Free guideline booklets and advice are available from the **Office of the Data Protection Registrar, tel. 0625 535777**, or at stands at major computer shows; also from some computer suppliers and libraries. The booklet gives some idea which types of databases and under what circumstances they must register. Registration "for three years costs less than your annual TV licence", says the current release.

Z88 ON FAX

Ā USA publisher has launched a monthly newsletter for Cambridge Z88 users — publisher through subscribers' fax machines.

Z88 Fax News, up and running since January 1990, is available by subscription 'anywhere in the world'. A free sample is available to anyone who sending a fax number to **Z88 Fax News, 2342 Glendale Avenue, Casper, Wyoming 82601, USA, or calling USA (307) 766 7026 by fax or voice.**

Z88 Fax News will also accept advertising. Publisher/Editor/Chief staff writer Curtis Claar works in the print media and is currently completing a BA in Journalism at the University of Wyoming.

The Cambridge Z88, the portable computer launched by Sir Clive Sinclair's company Cambridge Computer Ltd after the original Sinclair name was bought out by Amstrad, has inspired several dedicated publishing attempts, including one by former *QL World* publisher Focus. None have broken the barrier into newsstand success, but the Z88 remains a popular portable and second computer among its users, many of whom are also QL users.

Dutch QL

Sin-QL-air, the National Dutch QL Users' Club, has sent QL World a copy of its regular magazine. *Quasar*. The newsletter, published mainly in Dutch contains details of forthcoming meetings, and update list of QL users clubs in Europe, technical advice and "Testcase" reviews of hardware and software. They would like further products to test.

The next meeting announced within the life of this issue is in Eindhoven, Saturday 9th June, at St. Jorischool, Roostenlaan 290 (opposite the mini-zoo), 5644 BS Eindhoven, from

10am to 4pm. Tel. (school) (Dutch local) 040 116090. Information from J.J. van der Molengraar, Mullerweg 17, 5624JC Eindhoven. Tel. (Dutch local) 040 442309.

The Sin-QL-air Chairman is Ron Den Breems, Dongedal 14, 2904 CE Capelle a/d Ijssel. Tel. (Dutch local) 010 4505666. **Testcase/Quasar Editor is C.H.M. Biemans, Elzenstraat 5, 5461 CL Vegnel, Holland. Tel. (Dutch local) 04130 63224.**

TROUBLE

APROBL

Bryan Davies looks at disks and mdvs and does some arithmetic

The number of letters to *Trouble Shooter,* dealt with since this column was started in March 1987, has now topped 400. In one way, the fact that the letters keep coming in is not a good sign, because many of them are still complaints about bad service from suppliers. Fortunately, the complaints are balanced by general requests for help, on a variety of subjects. No claim is made to great technical expertise, but five years or so of playing with QLs has to give me some knowledge, and it appears that quite a few readers have been satisfied with the answers received. Where the going gets tough, there are other people on the QL scene who have much deeper technical knowledge in certain areas and are always willing to help provide answers. They can be difficult to track down just when they're needed though.

Don't let the ups-and-downs of the QL scene put you off. There are still enough people actively supporting the QL to keep us all going for some years yet. Those who went to the All Computers Fair at the New Horticultural Hall on April 28th may have reflected that the QL alone would have attracted as many suppliers and buyers a few years ago, but the message was also that much of the equipment on sale was for other computers which are now "obsolete", but will not lie down and die. Unless newer types of computer (and software) become very much cheaper, many users will stick with the ones they know best. After a few years with one type, you have a substantial investment in both hardware and software, let alone in man-hours, and there is no sense throwing it all away.

There are some benefits from all-computer shows; at this last one, there was a large array of disks for sale at the lowest prices I have ever seen, and many books at a few pounds each. Care Electronics, Sector Software, Digital Precision, EEC and TF Services seemed to be busy most of the time, as was Quanta the Users' Group (which seemed to be signing up several new members).

The price of microdrive cartridges is now anything from £3 to £5 each. Do you remember paying £4.99 each for them when the QL first came out? At the time there was no choice, but why keep on paying such large amounts now? The EEC stand at the fair had 20 cartridges for £60 – a not-unreasonable price, compared to what others were charging. The same stand had new (NEC and Citizen), bare 3½-inch disk drives for £49. Granted, you still need an interface, power supply, cable and case to make a bare drive usable, but does it make sense to pay more for about 2MB of unreliable storage space than for a reliable disk drive? Other stands were selling 3½-inch disks for as little as 40p each, in lots of ten. That is more than 2MB of storage space for £1.20.

Without spending a lot of time trying to find the cheapest supplier, I've just bought (mail order) twenty 3½-inch disks in an 80-disk box for £20. The box that arrived actually holds 100 disks, and I've no complaints about that. The supplier seems trustworthy, and I'd hesitate to buy unlabelled disks at only 40p each from anyone. Used on the QL, these disks will give me about 14MB of storage – £1.43 per MB (£0.72 per MB when used at high density on the PC!). That's considering the box as free; in fact, it normally costs £6.50, and taking that into account brings the memory cost down to £0.96 per MB. The 20 cartridges at £60 cost (at best) £27 per MB. For my money, I'd contact EEC for a disk drive.

There are several new or revised QL products in the pipeline, and some of them might be available by the time you read this. A lot of you are obviously still using *Quill,* and the campaign to get you to try something new will continue. The German version of *text*^{87} has been supplied to me recently. What a far cry the manuals are from the first effort of some years ago. German users get two substantial booklets; as yet, I've not had time to do more that skim through them, but they seem to be up to the standard of the current English-language version, and that is quite high.

This magazine has now survived its second change of ownership, and subscribers should be breathing a sigh of relief. There was some worry about distribution of the April issue, which was not surprising as the dealings over change of ownership were still going on when the copies were printed, and some overseas subscribers are still April-less as I write. The May issue was under way before the change, and got delayed by the inevitable change of premises, suppliers etc., but was out before mid-May. Things should be back on schedule by June or July issue. As has been said before, if you have anything to say about the magazine, a time of change is a good time to say it. Incidentally, while the main (IBM-type) PC magazine in the UK still costs (just) under £2, there are some decidedly skinny alternatives for well over £2. Price is related to the numbers of purchasers, and PC magazines can expect several times the number that we can, simply because there are roughly 20-30 million PCs around the world, compared to maybe 150,000 QLs. With perhaps only 10% of the owners/users of computers buying related magazines on a regular basis, it should be appreciated that *QL World* does not enjoy "economies of scale".

A new, and more substantial, owner for the magazine is good news, but it will not directly affect the performance of QL suppliers. As always, buy from a supplier you have reason to trust. If you are feeling aggrieved over losing £20-30 to a bad supplier, spare a thought for some of the contributors to *QL World,* who have lost very much more than that through the failure of the previous owners!

Readers' Letters

We have received a batch of complaints about **PDQL** service. They are mainly about failure to supply ordered goods, and to respond to letters and calls of enquiry. The general impression PDQL has been giving is that it has an answerphone, but not much else. As with most other QL suppliers, this one is essentially a one-man operation, and it is not surprising that the workload sometimes gets too much for one person to cope with. One consistent problem in small businesses appears to be the amount of time spent dealing with orders which do not produce enough income. Charging £5-10 for something which takes a day to do is not likely to lead to a successful operation. We all love buying things cheaply, but it is more in our interest to have suppliers survive than to save a few pounds for a year or two, then have nowhere to buy from. Attempts are apparently being made to put PDQL's affairs in order, and it is to be hoped they are successful.

Norman Foster asks for details of the connections from a Sinclair mono monitor to the QL, using a 9-pin DIN plug at the monitor end. Any offers?

William Bradley wrote to say he has

SHOOTER

EMSOLVED

been advised to give up the idea of trying to obtain the £60 still outstanding from his dispute with SUB. The message was that it would be throwing good money after bad. He was pleased by the support he received in his efforts to reclaim his expenses, and with the special price Miracle Systems quoted him for disk drives when SUB failed to provide them. Despite recent ill health, Mr. Bradley aims to keep on using the QL and studying computing for a few more years, which should take him well on the way towards his ninetieth year.

Two more complaints have been received about **SUB. M Wall** sent them his QL for repair in December '89 (it had been returned by them after a previous repair in July '89) and has heard nothing about it since. **S. Bedford** returned a faulty keyboard around the middle of '89, together with a cheque to cover the cost of a different type of keyboard, and has been unable to contact SUB since. The cheque has not been cashed, but he now has neither the faulty, keyboard nor the replacement, so is owed about £90. As indicated previously, we understand SUB have effectively ceased trading, although there has been no "official" information.

John Southern asked several questions, related to his recent purchase of a JS QL. One was about which back-issues of *QL World* he should buy. If you look at the **Sector Software** adverts, you will see that they offer a listing of items of interest in the magazine. Those readers who are members of Quanta can obtain a listing through that magazine's library service. Two other questions can be dealt with by one answer; if you need both a disk interface and memory expansion, the obvious people to contact are **Mircale Systems.** Unless you are on a tight budget, there is little (if any) merit in buying less than the 768 KB Trump Card. As that card is now not only cheaper, but faster, supports four floppy drives instead of two, and consumes less power, it is definitely the leader in this market.

A question to which I have never obtained a satisfactory answer is: what version(s) of Quill have an Export command? **M. J. Sims** has asked the question again. Years ago, I was supplied with a list of commands available from an upgraded version, and the list included the Export command. Unfortunately, the 2.35 version I received did not have the command. The listing was actually headed "2.36", but I am not aware that this version was ever supplied. The Export command is certainly in the version 1.1 Quill I have on my PC/AT. It is also in some versions of *XChange* on the Thor?

Harking back to the January 1987 issue of *QL World,* there was a program listing for a Rename function. **J. S. Hay** reports being unable to get it to work, despite "altering Checksum to the correct value". My brief attempt to get the program to work resulted in the message "At line 190 end of file" and I haven't discovered why that happened. Has anyone found out how to get it running? I did suggest to Hay that it would be better to purchase *Toolkit II* – which has the Rename command and many others – rather than fight a losing battle with this one routine.

We have received a cry from the heart from an Italian reader, **Ivan Zorzin.** He uses the MetaComco C-compiler, and his #1 program cartridge has become corrupted. He seems to have committed the cardinal sin of using his only copy for working with, but his excuse it that cartridges are unavailable in Italy now, the last ones he bought costing £5 each (see the comments earlier in this article). He has tried to contact MetaComco, without success. Can anyone advise either how to contact this company, or to obtain an original #1 cartridge? He also wants to obtain the HiSoft *Pascal Alteration Guide* for the ZX Spectrum (HP4T15M). His address is given in the information box below.

Ivan commented that he finds it difficult to obtain *QL World,* so he asks that I write to him in case he doesn't manage to buy this issue. In fact, answers are almost invariably sent by letter, and only some of the queries are mentioned here. As he says he would like to make contacts with other QL users, perhaps other readers might like to write to him.

There has been a fairly long-standing correspondence between a Portuguese QL user, **Duarte Mendes da Costa,** and myself, concerning speeding-up *Abacus* operations. He uses what I would think are very large spreadsheets by normal Abacus standards, and recalculations take an awful long time; I know this from samples he has sent me. Like most users, I spend little time with Abacus and can offer little advice on using it, but letters from various readers have given me the impression that some users are failing to go back to the User Guide and study the functions available. For instance, if you make several detail changes to a spreadsheet, and they each affect various cells through formulae, the program attempts to recalculate the total effect as soon as you Enter each new value. If you make ten small changes, you will wait for ten recalculations to be carried out. The way to avoid this is to go to the design screen and turn the Auto-Recalculate feature off. This stops recalculation taking place – at all – until you call upon the Xecute command; when you use this, *all* the stored, changed data is taken into account in one, big recalculation operation, and this takes far less time than doing each one separately.

The other command which I find it essential to use in any spreadsheet is Echo. An example of its use is when you have a column of data in which you wish to try "what if?" values. Other cells in the sheet will have formulae relating them to the values in this particular column. You can't simply say "multiply all values in this column by 2", as the values in the column are not derived from a formula; you have to manually enter the trial values into the column, on each row. When you have done that, the values are semi-permanently altered; you have to re-enter the original values to get back to where you were. You can deal with this situation, at the expense of using an extra column: if you don't want this column printed out, place it somewhere "off-screen". Keep your basic column as it is – the basic values with no formula. Give the extra column the formula "(original column and cell number) *multiplier". Make your formulae for the rest of the sheet relate to the extra column, instead of to the basic one. When you Enter trial values in each row of the extra column, the basic column will be unchanged but any related cells in the rest of the sheet will be recalculated on the basis of the trial values. You can return to your original position by entering 1 as the multiplier. To avoid the chore of entering a multiplier separately into each cell of the extra column, enter it only into the top row, then Echo the formula down through as many rows as need to be changed.

INFORMATION
Information on MetaComo & HiSoft required, and QL correspondents:
Ivan Zorzin
Piazza Dante 11
34079 Staranzano (GO)
Italy.

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The disk interface can access up to 4 disk drives (e.g. our DUAL 3.5" plus our 5.25") and has the same commands as are used for Microdrive control. There is an additional command FLP_USE which can be used to divert all MDV accesses to FLP (the floppy disk interface device name). This makes the transferring of your software from unprotected Microdrive (i.e. the majority of QL software including Quill, Abacus, Archive and Easel) to disk a trivial task. A simple step-by-step guide for transferring Quill as an example is given in the comprehensive TRUMP CARD USER MANUAL supplied with the TRUMP CARD.

The TRUMP CARD 768K's RAM adds to the QL's own 128K giving a total of 896K. Like the firmware the extra RAM is installed automatically when the QL is switched on so that no installation procedure is necessary. The exception to this is TOOLKIT II which can be left uninstalled for compatibility if you have other toolkits; installation consists of simply entering the command TK2_EXT.

Fitting the TRUMP CARD 768K is easy - you remove the door at the left hand end of the QL and slide the TRUMP CARD into the expansion port. A "Beginners Guide" on pages 3 and 4 of the TRUMP CARD USER MANUAL will quickly get the novice and experienced user up and running.

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- ☆ Through connector for ROM cartridge
- ☆ Fully compatible with TRUMP CARD

We recommend that you consider purchasing the QL HARD DISK only if you have already upgraded to floppy disks (e.g. TRUMP CARD PACKAGE) so that backing up is practical. Also the QL HARD DISK uses about 55K of RAM leaving little room in an unexpanded QL for programs.

QL 5.25" DISK DRIVE £125 (£114)

- ☆ 360K capacity
- ☆ Ideal for Conqueror
- ☆ Through-con for dual 3.5"

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(Needs disk interface e.g. TRUMP CARD)

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(Needs disk interface e.g. TRUMP CARD)

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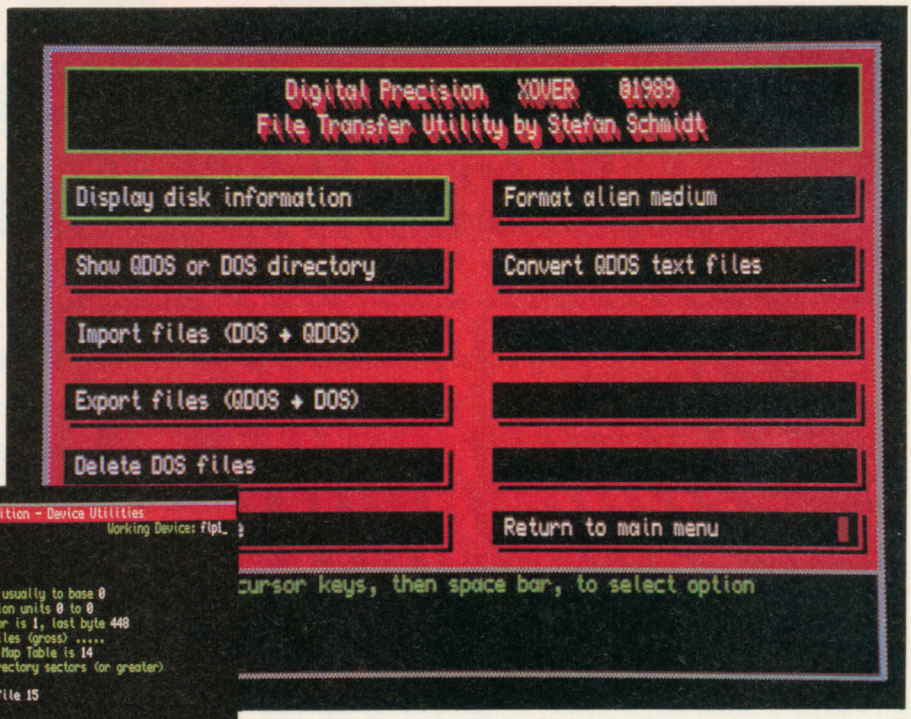
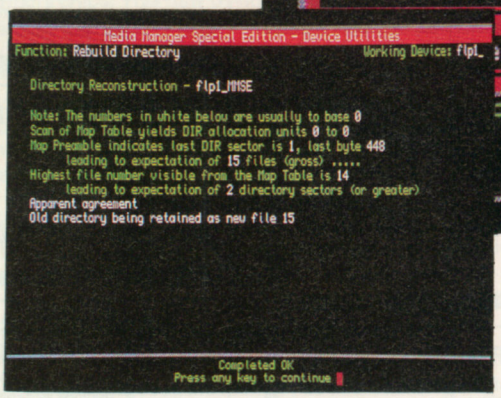
MEDIA MANAGER S.E. PART II

This is the concluding part of the review of this program. Part 1 dealt with the general structure of the program, and the recovery procedure for corrupted files.

The program is far too extensive for descriptions to be given here of all available options, but the ones not already mentioned are (from the main menu) Set Machine Date, (Primary Device Selector menu) Dispaly System Settings, (Utilities menu) Rebuild Directory (see **Figure 7**), Recover Deleted File (see **Figure 8**), Show Volume Characteristics, Show Mapping Table, (Directory Management menu) Selective Copy, Selective Delete, Selective Rename, Alter Volume Name, Volume Management (not yet implemented), Sort Directory, Write Directory, Selective Directory, Alter Case of Filenames. The names are descriptive enough to give a fair idea of what the options do.

The manual offers a couple of bits of advice on recovering Psion files. One is to use the PDQL program *Recover* for Archive files, because it is specifically designed for this function and should make recovery rather easier and faster. The other is to use *The Editor* to sort out recovered Quill files before Importing them back into *Quill*. You can safely remove everything after the last bit of text, because Quill will put back what it needs when it Saves the recovered file after Import-ing it.





The *XOver* utility is provided with various DP programs which might have need of the capability to move files between different types of computer. Perhaps the most obvious pairing of computers is the QL with IBM PCs or their clones, but the Atari TOS format is similar to the IBM PC-DOS (= MS-DOS), and is used by some QL owners, so it tends to be included in transfer programs. If you don't have the capability for recovering corrupted files on your PC/ST, why not transfer them to your QL and fix them there?

The reservation to this process is the well-known one — transfers are only straightforward when done with Ascii files. This basically limits you to "pure text" files, but it is these you are most likely to want to recover; hopefully, you keep backups of program files, even if you don't accord data files the same honour. Most familiar application programs (word-processor, spreadsheet, database) have export and import functions, allowing Ascii files to be both created and loaded. If there is file formatting information unique to the particular program in its "normal" data files, it may get lost during transfer but it will be added to files again when they are saved normally after being imported.

The MMSE MS-DOS/TOS File Copier (*XOver* by another name) is called from the main menu. The first sub-menu (**Figure 9**) offers the options to get information on the disc (tracks, available space etc), see a directory of the files on the disc, import files (DOS-to-QDOS), export files (QDOS-to-DOS), delete or rename DOS files, format DOS or TOS discs, and convert QDOS text files. As far as QDOS devices are concerned, both ram and microdrive are also supported. There is no option to View files. The program does recognise one level of DOS sub-directories, but will only deal with files in the root directory. One disc with a fairly complex sub-directory structure was rejected, but this may have been because some sectors on it had been marked as bad on the PC.

Because of the limitations of the QL interface, rather than the program, high-density (1.2 or 1.44 MB) discs cannot be used. Direct sector addressing is performed, which is a function some older QL interfaces do not support; Care Electronics may be able to help with upgraded interface eprom chips, in some cases. The MCS interface is quoted as one that definitely is not suitable. The program doesn't mind which disc format is in which drive; the format is automatically recognised and the required operation performed.

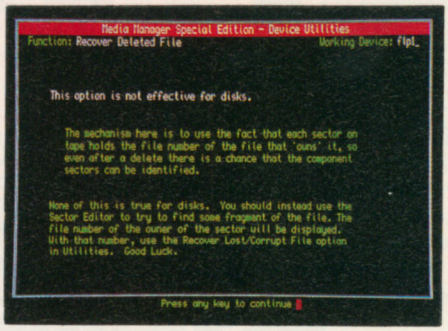
As an innocent user, you may not realise that programs sometimes object to discs being write-protected, even when no save operation is scheduled (so far as you know), so check the protection tab if you get unexpected messages from QDOS. There is really no need for instructions, as the actions required are clear from the screen display. When a choice between file names has to be made, such as when importing or exporting, you are given the option of typing in the file names from memory, or selecting them from a directory. The familiar Y/N/A/Q (Yes/No/All/Quit) options are offered in the latter case. No indication is given of how a transfer is proceeding, but that will not matter much unless files are long (in which case a progress indicator can be at least comforting). Rather surprisingly, although full details of files are given, the

directory information does not include total and available space on the discs.

QDOS and DOS/TOS place different restrictions on file names. QDOS file names can be too long for the other systems, so "surplus" characters in names are dropped. This can lead to more than one file having the same name when transferred, and you are then asked whether or not the existing files(s) should be overwritten. The QDOS underscore is replaced by the period.

Mode Corresponds

The choice offered for formatting discs is the MS-DOS 360KB 40-track or 720KB 80-track, and the TOS SS or DS (single-sided or double-sided) equivalents, all being at nine sectors per track. The MS-DOS format mode corresponds to version 3.3 of that operating system; one thing it will do which I have not persuaded version 3.30 to do on my PC/AT is format a 3½in disc to 360KB. There is no facility for giving discs volume names. The type of format done relies on discs having been formatted at some previous time, and any previous format being of a recognised type. The instructions say discs should be given a QDOS format beforehand. None of the options offered worked on a disc which was formatted to 1.44 MB under MS-DOS; once re-formatted under DOS to 720KB, the same disc could be given any of the four formats listed. Whatever the similarities, the TOS format was not recognised by my DOS machine. Formatting takes under ten seconds, and is obviously of the "quick" type, which simply deletes file entries in the directory, rather than writing over the whole disc as the normal MS-DOS format does. This is all that is needed on most occasions, but it doesn't work with unformatted discs, and is inadequate when information must be cleaned off the disc (for instance). It is unsuitable for discs which have bad sectors, because it assumes all sectors are good and leaves the danger of the bad ones being written to subsequently.



The Convert option of the File Transfer menu takes QDOS, DOS or TOS files and turns them into DOS or TOS, QDOS, or QDOS form respectively. The discs used must be QDOS format.

The purpose of conversion is to allow for differences in the ways character codes are handled by the three operating systems. The familiar, printable codes are not a problem, but special characters (those with codes greater than 128) can be. Complete conversion is not possible because some characters are not common to all three sets, so the program converts what it can. It also alters the EOL (end of line) code to suit — one CR (carriage return) character for QDOS, CR + LF (line feed) for DOS and TOS. No facility is offered for converting codes specific to particular programs into equivalent ones for other programs.

Media Manager Special edition is good. There is a comprehensive range of options, which work well, and a slick and functional menu structure. There is a wide range of possibilities to allow for in the way of corruption to cartridge and discs, and only a representative sample was checked for this review, but there appears no reason to think the program is not up to the task of recovering any data which can reasonably be classified as recoverable.

Whereas I would previously only tackle recovery jobs which could be handled using *The Editor*, or a specialised utility such as PDQL's *Recover*, I now feel confident enough to venture into serious recovery work — something I had abandoned after lengthy sessions with the original Media Manager.

QL SUPERTOOLKIT II by Tony Tebby

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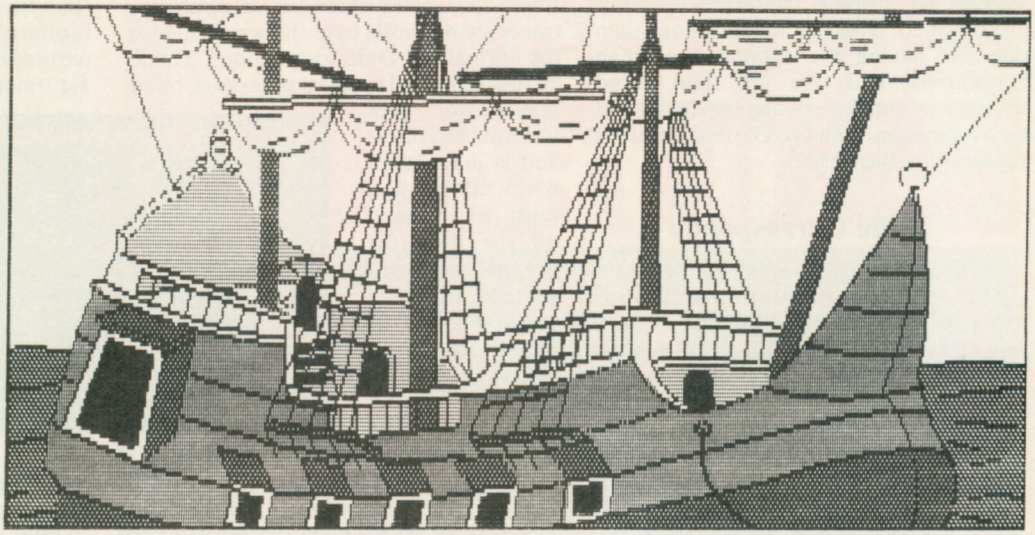
SOFTWARE FILE



Program: Voyage of the Beano (256K minimum)
Publisher: CGH Services, Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA.
Price: On microdrive £14 (text only) on disk £10 (with graphics)

VOYAGE OF THE BEANO

Rich Mellor dares all in an Elizabethan pirate disco.

This new adventure written by Alan Pemberton is available in two forms: a text only version which is available now, and a graphics version (graphics by Francis O'Brien and Alan Pemberton) which should be out by the time that you read this review. This review is based upon a pre-release graphics version, but will apply equally to the text-only version.

This adventure is yet another step in a new direction for Alan, since although he has returned to the normal text parser (instead of the icon system used in *Starplod*), this is the first one of Alan's adventures to incorporate graphics screens for each location.

The setting is in Elizabethan times, and you begin outside a town somewhere in the South of England, with only your orders from the Queen to bring back as much gold as possible. Unfortunately, you have neither ship nor crew and very little idea of where to go to find this much-loved gold. A quick visit to the pier will find you a ship and two crew members, but this is hardly enough to sail a large sailing ship. The only inhabited place in town to which you can gain entry is the pub, but oddly enough no-one wants to be press-ganged, so they all run out of the fire exit as soon as you step in the door, leaving only Betty the Barmaid to chat to.

Indeed within a few minutes play you will find that there are several people with whom you must interact, although naturally some are more willing to co-operate than others. Commands enable you to communicate with the people you meet on your travels. For example, 'Larry, follow me' will get one of your crew to follow you around. How much use this is I cannot really say, but suffice it to say that they can carry things around for you and maybe even help you in some situations. Bars are always good places to pick up the local gossip, so a quick chat with Betty may give you some clues about what you are doing.

There are not that many locations in England and the road to London seems particularly long and worthless — maybe it is the dread of facing the Queen's wrath when she finds out that you have dared to return to the capital without bringing any gold. Later on in the game, having obtained your new crew's co-operation, you can set sail across the high seas in search of the promised treasure. The ship is easily controlled using 'sail west', 'sail south' etc. . .

There are one or two islands to explore and locals to contend with before you even start to taste the gold. There is one especially nasty piece of work: Captain Blubber, who seems to spend most of his time in his very own disco, chatting up women and drowning his sorrows when they tell him where to go. What is even worse is that his bouncer seems to be related to Fagin, and leaves you feeling somewhat lighter in the pocket than when you entered the place.

Once you have sorted out Captain Blubber, you have to make a dash through risky waters in your ship to avoid his temper. By now you should have obtained something which will be helpful in finding your gold. Eventually you end up in a South American Spanish resort, the equivalent of a modern day Torremolinos; trampled and ruined by the tourist trade, which has not left the native villagers feeling too happy.

Here you have to contend with a priest carrying a collecting tray, a volcano and poisonous spiders. But soon you find the gold and manage to get it all back to your ship, just in time to catch the high tide and begin your journey across the high seas back to England. The journey seems rather uneventful as you pass through the South Atlantic doldrums, although Captain Blubber, still angry from his embarrassing ordeal, soon catches up with you. Can you defeat him and get back to the Queen with all of your gold, or will the ship, you and your crew end up in Davy Jones' Locker?

I have now completed the game and must say that I thoroughly enjoyed it. Having seen a few of the graphics for the program, I cannot wait until all of the drawing is complete, since it certainly adds another dimension to the enjoyment of the game. The graphics do not take very long to load and stay on the top of the screen while you carry out your commands. On some screens, people appear and disappear as things happen in the adventure.

About my only moan with the program is that like all of Alan's other adventures, it is addictive and therefore seems to be over all too soon. It may not have hundreds of locations, but the puzzles are varied and require much planning ahead, especially since the winds on the high seas dictate which routes you can take, so that there cannot always be the option of turning back.

Overall the adventure is well worth the money and hours of enjoyment await the next unwary adventurer to enter Alan's time machine and end up in days of pirates, gold, excitement and Queen Elizabeth. Okay, so the adventure is not all that consistent with the times it is set in (how many discos and television aerials existed in the 1500s?) but it would not be true escapism if the author was not allowed some sort of artistic licence. What more can you ask for?

ARCHIVE POWER PART II

Robin Stevenson continues his series on Archive.

Last month we began development of an *Archive* application to provide a number of desktop functions for your QL, and in the process provide a range of toolkit procedures that can be used in your own programs. We continue both of these objectives this month, with some major enhancements to the Notepad/Card-Index program, and also new toolkit procedures to enhance the WINDOW facility, and give user control to printer re-direction.

Before we move on to the listings, though, we shall take a look at the SEDIT screen to be developed this month. This is to be used by the PAGEPRINT procedure, to give the user control over the printout to be produced. To this end, six values are entered on the screen, which can then be modified at print time. We shall look at what the values do later. One interesting feature of this screen is that none of these values represents file variables. In fact, they will all be local memory variables of the PAGEPRINTE procedure. The screen will be used by the SINPUT command to get the values of each variable in turn.

A more striking feature of the screen is that it has been produced in MODE 1,4 screen mode – not a widely used Archive mode. The reason is to do with the way SEDIT screens are produced, and the effect required. What is required, when a print is requested, is a red box in the middle of the screen, allowing the user to select the options shown without losing sight completely of the text to be printed. So how do we do this with a SEDIT screen?

The vital fact to remember about a SEDIT screen – with the slight complication of screen variables – is that it is just a list of printing instructions for each line of the screen. When you use SEDIT to create the screen, the character values are collated into a printable form, and when you use the SCREEN command the whole lot is simply printed to the screen, using the screen driver functions to control colours, etc. If you use SEDIT in 80 column mode, each print line will have 80 characters to be printed out and – should you be in a different mode – will wrap around, over themselves. On the other hand if you use SEDIT in 40 column mode, each line will only have 40 characters and, after printing them, will move the next line. By selecting the MODE when creating the screen, you decide if the line is to be 40, 64 or 80 columns wide, regardless of the mode you finally use it in.

Furthermore, when using SCREEN, Archive disables all scrolling. If you define a window only nine lines deep, the first nine lines of the screen remain intact, even though the SEDIT screen creates up to 25 lines of printing. It is the lower portion which is lost. By using the WINDOW command produced last month to define a window of 40 columns across, and nine lines deep, we can place the screen in **figure one** at any desired point on the screen. The end result can be seen in the screen dump in **figure two.**

When we come to look at **listing two**, we shall provide even more enhancement for this small window idea. Before then we shall look at **listing one**. This replaces part of the temporary START procedure shown in last month's *QL World*. However, instead of being added to the existing program, it is to be a separate initialisation program, from which the main NOTEPAD program is run. The two variables declared last month are both replaced. TODAY$ is redesigned to give a much better form of the date, and HEADING$ incorporates a line to be printed on the top of the screen. This makes it clear which program you are running – a problem if you retain the same layout for a

ORJS ARCHIVE DESKTOP 1990

ENTER REQUIRED PRINT OPTIONS

NOTEPAD/CARD INDEX Page 3 File NOTEPAD

Title line : NOTEPAD – PRINTING

The printing options are selected rather differently from most of the menus in this program. Rather than a series of questions at the top of the screen a window is opened in the centre of the screen, with a list of the various possibilities and his list, entering the value require entering a 1 or 0 is required. For the should be entered. PRINT FROM PAGE – om. The default

Start printing from page	1
Print up to and including page	4
Include PAGE and DATE? (1 - YES)	0
Include TITLE line? (0 - NO)	1
Include BLANK lines? ( )	1
End Of Line procedure	2
(0 - None 1 - Extra Line 2 - FormFeed)	

PRINT UP TO AND IN ist page to print. es. To print only nde fields. INCLUDE PAGE AND D date are to be printed before each page.

INCLUDE TITLE LINE? – Enter a 1 if the title line is to be printed.
INCLUDE BLANK LINES? – Enter a 1 if lines with no test are to be printed.
END OF LINE PROCEDURE – If you wish an extra line between each page, enter a 1. To print each notepad page on its own sheet (with a FormFeed between) enter 2. Enter 0 for neither.
An OUTPUT menu then allows you to redirect to the screen, or a file.

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Figure one.

LAYOUT mode
F3 to set variable
Use cursor keys and ENTER to move cursor and type screen background

HELP F1 | PROMPT F1 | COMMANDS F3 | ESCAPE ESC

Start printing from page : . . . . .
Print up to and including page : . . . . .
Include PAGE and DATE? (1 = YES) : . .
Include TITLE line? (1 = NO) : . .
Include BLANK lines? ( ) : . .
End Of Line procedure : . .
(0 = None 1 = Extra Line 2 = FormFeed)

Where the dots are shown above, you should enter the variables:–
BEGIN, END, PAGENUM, TITLELINE, BLANKS and EOP. Leave this bottom part empty.

Use mode 1,40 to produce this screen.

Fill area with red paper

0
1 VARIABLE 'BEGIN'
2 VARIABLE 'END'
3 VARIABLE 'PAGENUM'
4 VARIABLE 'TITLELINE'
5 VARIABLE 'BLANKS
6 VARIABLE 'EOP'
7 VARIABLE
8

(ONLY THE TOP 9 LINES ARE USED)

Figure two.

number of programs. It again utilises the screen driver – something regular readers of this magazine should by now be familiar with – to resize the window, and turn off the cursor. In addition to these variables, several others are declared for use by the main program.

By providing a short load program in this way, saved as a normal (rather than object) file and run by typing RUN "DESKTOP", a loading message will quickly be displayed. The main program (which should be called NOTEPAD and saved as an object file) will then be loaded and run automatically. It is important, after any editing, to save the DESKTOP program before running it. Once it runs the chained program the original will be lost from memory. This is true of any program that runs another. To be on the safe side, precede the RUN statement with 'REM' until you are happy the rest of the program is working correctly. From now on, whenever you need to re-load the NOTEPAD procedures type RUN "DESKTOP", which will initialise the variables, and load NOTEPAD, ready for editing.

Initialisation

Note that the main reason for using a separate initialisation program in this slightly awkward way is to save memory in the main program. If you have loads of memory and fast disk drives, you could choose to dispense with it and combine listing one with last month's and this month's main listings. This should present no problem. Instead of running the NOTEPAD program, you can simply call the DESKTOP procedure developed in listing two.

Listing two is the main listing for this month, and should be added to last month's program. The first four procedures are this month's Toolkit procedures. As last month, the Sinclair Numeric and String expression conventions are used to show required parameters, as well as indication of how the result is passed back.

BOX;<n.exp>,<n.exp>,<n.exp>,
<n.exp>,<n.exp>

This is an enhancement of the WINDOW procedure shown last month. The purpose is to define a coloured box, with 'offset' borders to the left and bottom. The first four parameters are the width, depth, left and top positions as with WINDOW. The additional parameter is the required colour. This colour forms the background of the window. It is also used for the border, but in the stipple pattern of CHR(210), using 'transparent paper', so that the underlying background/text will also show through. (CHR(18) selects the paper type, with 1 being transparent.) In order to get acceptable speed in drawing, each border line is sized as a window, to be filled with the repeated stipple charac-

```
ROBIN STEVENSON   ARCHIVE POWER   Part Two    Listing 1

Listing One for Part Two
Listing One - Enter this as a separate Archive program and save it
              as  "DESKTOP".


 proc START
   mode 0,8: print at 8,18;chr(15);
   print paper 2; tab 26;"ARCHIVE DESKTOP NOW LOADING"; tab 62
   error SYSVARS
   run object "NOTEPAD"
   endproc
-------------------------------------------------------------------
 proc SYSVARS
   let HEADING$=chr(20)+chr(0)+chr(0)+chr(80)+chr(25)+chr(15)
   let HEADING$=HEADING$+chr(127)+"RJS"+chr(9)+chr(32)
   let HEADING$=HEADING$+"ARCHIVE DESKTOP"+chr(9)+chr(76)+"1990"
   let WEEKDAY=days(date(0))-(int(days(date(0))/7)*7)
   if WEEKDAY<1: let WEEKDAY=WEEKDAY+7: endif
   let TODAY$="Sun Mon Tue Wed ThurFri Sat "
   let TODAY$=TODAY$(WEEKDAY*4-3 to WEEKDAY*4)+" "+date(0)(9 to )
   let TODAY$=TODAY$+" "+month(val(date(0)(6 to )))( to 3)
   let TODAY$=TODAY$+" "+date(0)(1 to 4)
   let MARGIN=10                    : rem SPACES IN FROM LEFT EDGE
   let UPPERMARGIN=5              : rem LINES TO SCROLL AT TOP OF PAGE
   let TEMPFILE$="mdv2_"          : rem USE RAMDRIVE IF AVAILABLE
   let CALCMAX=20       : rem NUMBER OF CALCULATIONS TO KEEP STORED
   endproc
```

```
ROBIN STEVENSON   ARCHIVE POWER   Part Two    Listing 2

Listing Two - Add these procedures to the NOTEPAD program
              developed last month

 proc START
   error DESKTOP
   error SHUT;"": mode 1,8
   endproc
-------------------------------------------------------------------
 proc BOX;WID,DEP,LEFT,TOP,COL
   WINDOW;2,DEP,LEFT+WID,TOP+1: ink COL
   print chr(15);chr(25)+chr(15);       : rem DRAW LEFT SIDE BORDER
   print chr(18)+chr(1)+rept(chr(210),DEP*2-2);
   WINDOW;WID+1,1,LEFT+2,DEP+TOP          : rem DRAW BOTTOM BORDER
   print rept(chr(210),WID);chr(18)+chr(0);
   WINDOW;WID,DEP,LEFT,TOP: paper COL: ink 0: cls    : rem FILL BOX
   endproc
-------------------------------------------------------------------
 proc SPOOL
   local T$: let ANSWER=0: while ANSWER=0
     let T$="OUTPUT TO: 0. Cancel  1. Printer"
     GETCHOICE;T$+"  2. Screen  3. File",3,"CPSF"
     let PRINTON=ANSWER
     if ANSWER=0: error : endif      : rem FORCE ERROR IF CANCELLED
     if ANSWER=1:CONFIRM;"Is the printer ready"
       if YES: spooloff : endif : endif
     if ANSWER=2:WINDOW;76,19,2,5: spoolon screen : cls : endif
     if ANSWER=3
       GETSTRING;"Enter destination file name",""
```

```
      CONFIRM;"Do you wish to include printer control codes"
      if YES: spoolon ANSWER$
        else : spoolon ANSWER$ export : let ANSWER=3: endif : endif
    if ANSWER=1              : rem IF PRINTER, OR SPOOLED WITH CODES
      lprint rept(chr(10),UPPERMARGIN);
      endif : endwhile       : rem ONLY LOOP IF PRINTER IS NOT READY
  endproc
-------------------------------------------------------------------------
proc PRINTOFF
  if PRINTON=2
    GETCHOICE;"Print finished. Press SPACE to continue",1," "
    endif                    : rem COULD USE OTHER EXIT FOR IF PRINTON=1
  spooloff : let PRINTON=0
  endproc
-------------------------------------------------------------------------
proc TEMPMERGE
  merge TEMPFILE$+"TEMP"
  error TEMP                 : rem ERROR TRAPPED MERGE AND RUN OF TEMP
  endproc
-------------------------------------------------------------------------
proc DESKTOP
  local OPTION: let OPTION=1: while OPTION    : rem ***** MAIN LOOP
    sload "NOTEPAD": error SHUT;""
    mode 0,8:WINDOW;80,4,0,0: screen
    BOX;30,6,25,8,4: ink 0: paper 4    : rem DISPLAY OPTIONS IN BOX
    print at 1,4;"0. Exit from DESKTOP"
    print at 2,4;"1. Notepad/ Card Index"
    print at 3,4;"2. Calendar"
    print at 4,4;"3. To Do List/ Diary"
    ink 7: paper 0:GETCHOICE;"DESKTOP",3,"ENCT"
    print at 9+ANSWER,25;chr(18)+chr(2);     : rem HIGHLIGHT CHOICE
    print ink 2;rept(chr(220),30);chr(18)+chr(0)
    let OPTION=ANSWER                  : rem TAKE APPROPRIATE ACTION
    if OPTION=1: error NOTEPAD: endif
    if OPTION=2: error CALENDAR: endif
    if OPTION=3: error TODOLIST: endif
    endwhile
  endproc
-------------------------------------------------------------------------
proc PAGEACT
  local OPTION,START,END,DIREC,T$
  let T$="0. Exit  1. Insert  2. Cut"
  GETCHOICE;T$+"  3. Sort/select  4. Different file",4,"EICSD"
  let OPTION=ANSWER
  if OPTION=3: error PAGESORT: endif
  if OPTION=4:NOTEPAD: endif         : rem CALL NOTEPAD RECURSIVELY
  if OPTION=0 or OPTION>2: return : endif
  let START=1: print at 5,0;     : rem ONLY INSERT & CUT, FROM HERE
  while START<=19: print gen(START,2)
    let START=START+1: endwhile              : rem NUMBER THE LINES
  let REDRAW=1
  if OPTION=1: let START=19: let DIREC=-1        : rem IF INSERTING
    GETSTRING;"Insert before which line?",""
    let END=val(ANSWER$)
    else : let END=19: let DIREC=1                : rem IF CUTTING
    GETSTRING;"Cut which line?",""
    let START=val(ANSWER$): endif            : rem EITHER FROM HERE
  if val(ANSWER$)<1 or val(ANSWER$)>19: return : endif
  spoolon TEMPFILE$+"TEMP_PRG" export
  lprint "proc TEMP"               : rem WRITE TO THE TEMP PROCEDURE
  while START<>END                        : rem FOR EACH LINE MOVED
    lprint "LET N";START;"$ = N";START+DIREC;"$"
    let START=START+DIREC: endwhile
  lprint "LET N";END;"$='!"          : rem FINISH WITH A BLANK LINE
  lprint "ENDPROC"
  spooloff : error TEMPMERGE: update        : rem MERGE & CALL TEMP
```

ter, before resizing to the main box size. Faster speeds could be gained by ignoring WINDOW altogether, and printing the windowing instructions directly. But this would obscure even more what is actually being done.

SPOOL : result in ANSWER, PRINTON, or errnum()

This provides user control of print redirection. The SPOOLON command in Archive is extremely useful, allowing the same printing routine to be used for the printer, the screen, or to a disk/microdrive (in either export or printer formats). SPOOL makes all of this accessible from a standard menu, making appropriate actions, depending on the response.

Output sent

Firstly, it puts the response in the variable PRINTON, which means that other procedures can find out where the output is being sent to. If this is to the printer, further confirmation is requested that the printer is ready. If screen output is requested, a suitable window is opened in the data area, giving a much neater appearance than scrolling the whole screen. If it is to be a file, the name is requested, and whether it is to be export or printer format. Finally, if the printer or spooled printer format has been chosen, the UPPERMARGIN variable is used to send the required number of line feeds, before printing commences. It is up to the application to provide this for follow on pages, if required. It would be possible to add additional printer commands (to add to the printer driver preamble) at this point.

The other option, not mentioned above, is option 0, to cancel the print. If this is selected, SPOOL takes the unusual step of forcing an error – by using the ERROR command illegally. The reason for this may seem convoluted, and is open to a charge of dodgy programming, but it makes the programming much simpler. The intended situation is a procedure we shall call PRINTOUT which has been called by another, which we shall call MAIN. If PRINTOUT calls SPOOL without error trapping, the error will return control back – not to PRINTOUT, which would otherwise need to check if printing is to go ahead – but to MAIN, which must trap the error. PRINTOUT can assume printing is to go ahead after calling SPOOL. Any other errors in printing – even pressing the escape key to halt printing – will also be trapped by MAIN.

PRINTOFF is the matching pair to SPOOL, and should be used after printing has finished. Not only does it call SPOOLOFF – essential if spooling to disk – but also provides a break after printing to the screen. Ensuring SPOOLOFF is called is important for printer use too. It will output the printer driver postamble,

and give a fresh look at the printer driver when the next LPRINT occurs. GETCHOICE has the (in this case beneficial) side effect of resizing the window to its full dimensions. It is important that PRINTOFF is called, not by the PRINTOUT procedure, but by MAIN, after PRINTOUT has finished. In this way, errors or interruptions to PRINTOUT will not leave spooled files unclosed. If required, SPOOLOFF could be used to add extra postamble-style print commands, for when printing is complete.

TEMPMERGE : returns errnum()

This final toolkit procedure is simply an error trapped merge and run program. A useful ploy on occasions is to create and merge a temporary procedure from within your program. As will be seen later, this adds greatly to the flexibility of many commands, although at the expense of speed. (If you have declared TEMPFILE$ to be a ramdrive, you will get much better results here.) The TEMPMERGE procedure uses the TEMPFILE$ drive specification, to look for a program called TEMP.PRG. containing a procedure called TEMP. (As you can see, permanence is not a required attribute here.) Provided the file is a valid Archive file, and TEMP runs without error, there will be no errnum() on return.

We turn our attention now to the application procedures. The first is the replacement version of START. After running DESKTOP, it makes sure everything is tidy before ending. You may wish to add QUIT here, to leave Archive completely, but not until you are sure it is saved and working correctly.

Main menu

DESKTOP is the main menu for the three principal parts of the program. To make it look a little more interesting we shall use more than the single line of GETCHOICE. Instead, the full screen is brought into play, with the options in a box in the middle. A number of interesting techniques are used to display this in an orderly, rapid fashion. After SLOADing the NOTEPAD screen, only the top four lines are displayed at this point. This gives the red line, and access to ANSWER$, without the effort – or time – of an extra full screen. Next, BOX is used to give a green menu box, which then has the options written in. Finally the choice is made, via GETCHOICE, (which also resizes the window back to full). Once the ANSWER is known, DESKTOP highlights the chosen option by XORing a row of stipple characters, which leaves black lettering black, while highlighting the background. The appropriate option is then called (although NOTEPAD is the only one available so far). After completing the option, the loop returns for another selection, unless 0 is selected, when the loop will end, and return to START.

```
  endproc
-------------------------------------------------------------------------
proc PAGESORT
  local COUNT,CHR$,T$: let COUNT=2: let CHR$=chr(34)
  let T$=" 0. Exit 1. Page ordering 2. Line ordering"
  GETCHOICE;"  3. Select by title entry  4. Reset",4,"EPLSR"
  let T$=TEMPFILE$+"TEMP"
  if ANSWER=4: reset : order PAGE;A: last : endif
  if ANSWER=1
    CENPRINT;2,"Sorting..."          : rem RE-ORDER PAGES BY TITLE
    order TITLE$;A: let START=0
    while not eof(): let PAGE=START: update   : rem RENUMBER PAGES
      next : let START=START+1: endwhile
    order PAGE;A: locate 1       : rem RE-ORDER WITH NEW PAGE ORDER
    endif
  if ANSWER=2
    CENPRINT;2,"Ordering..."      : rem ORDER LINES OF CURRENT PAGE
    spoolon T$+"_EXP" export       : rem EXPORT EACH LINE TO A FILE
    lprint CHR$;"LINE$";CHR$
    while COUNT<numfld(): lprint CHR$;fieldv(COUNT);CHR$
      let COUNT=COUNT+1: endwhile
    lprint chr(26);: spooloff
    spoolon T$+"_PRG" export    : rem GENERATE PROC TO DEAL WITH IT
    lprint "proc TEMP": let COUNT=2
    while COUNT<numfld()              : rem FOR EACH EXPORTED LINE
      lprint "if eof(): let LINE$='': endif"
      lprint "LET NOTEPAD.";fieldn(COUNT);" = LINE$"
      lprint "NEXT"                  : rem COPY INTO A LINE ON PAGE
      let COUNT=COUNT+1: endwhile
    lprint "endproc": spooloff          : rem END OF TEMP CREATION
    kill T$+"_DBF"                        : rem IMPORT THE LINES
    import T$+"_EXP" as T$+"_DBF" logical "SORTED"
    use "SORTED": order LINE$;A: first      : rem PUT THEM IN ORDER
    while LINE$="": next : endwhile   : rem GET RID IF EMPTY LINES
    error TEMPMERGE: update "NOTEPAD": close "SORTED"
    use "NOTEPAD": endif       : rem USE TEMP TO COPY LINES TO PAGE
  if ANSWER=3
    GETSTRING;"Select records with a title including what?","XXXX"
    CENPRINT;2,"Selecting..."      : rem SELECT FROM TITLE ENTRIES
    select instr(TITLE$,ANSWER$) or PAGE=0: locate 1
    endif        : rem USE XXXX TO MANUALLY SELECT CERTAIN RECORDS
    endproc
-------------------------------------------------------------------------
proc PAGEPRINT
  local EOP,TITLELINE,BLANKS,PAGENUM,BEGIN,END,C,P,LINE$
  let P=PAGE: let TITLELINE=1: let BEGIN=P: let END=PAGETOT
  let REDRAW=1: sload "PRINTOPT":CENPRINT;1,""
  CENPRINT;2,"ENTER REQUIRED PRINT OPTIONS"
  BOX;40,9,20,8,2: screen : sprint      : rem DISPLAY OPTION SCREEN
  sinput BEGIN,END,PAGENUM,TITLELINE,BLANKS,EOP
  WINDOW;80,25,0,0: sload "NOTEPAD": print chr(25)+chr(0)
  SPOOL: locate BEGIN     : rem GET OUTPUT DEVICE, & START OF PRINT
  while PAGE<=END and not eof()            : rem LOOP FOR EACH PAGE
    if PAGENUM: lprint tab MARGIN;"Page ";PAGE
      lprint tab MARGIN;date(1): lprint : endif
    if TITLELINE: lprint tab MARGIN;TITLE$: endif
    let C=1: while C<=19          : rem LOOP FOR EACH LINE OF PAGE
      let LINE$=value("N"+str(C,2,0)+"$")
      if ( not (LINE$="" and BLANKS=0)) and instr(LINE$,"///")<>1
        lprint tab MARGIN;LINE$
        endif : let C=C+1
      endwhile                       : rem END OF LOOP FOR EACH LINE
    if EOP=1: lprint : endif          : rem EXTRA LINE IF REQUIRED
    if EOP=2: lprint chr(12);: endif    : rem FORMFEED IF REQUIRED
    next : endwhile                  : rem END OF LOOP FOR EACH PAGE
  locate P                         : rem RESTORE THE PAGE BEING USED
  endproc
```

Now we start to add some of the interesting features to the NOTEPAD program. PAGEACT gives the menu for the 'actions', and provides the code for two of them. A request for Sort/Select is passed to the appropriate procedure (this helps keep individual procedures to a manageable size). A change of file is achieved by recursively calling the main NOTEPAD procedure. This is a quick and dirty technique which saves a lot of code, but will consume a fair chunk of memory each time you use it. On the other hand, it makes it easier to use different notepad files for different purposes. If either of these, or the 'do-nothing' option zero, are called the procedure will return at this point. Only the Insert and Cut options will pass on to the main body of the procedure.

Line editing

If you have done some experimenting with the NOTEPAD program, you will have noticed one of its main limitations is that it is not a true page editor. Because it is made up of Archive record lines, each line is fixed at the point you type it in. The Insert and Cut options go a little way to reduce the inconvenience of this. The provision is fairly rudimentary, allowing a line to be inserted (moving those below it down a line) or to be cut out (with the subsequent lines all moved up a line). With a bit of work you could possibly add pasting of cut lines, and dealing with more than one line at a time. The technique employed is not quick – but much better than re-typing half the page.

The same piece of code handles inserting and cutting, and needs to know the starting and finishing point of the action and the direction to work in. Inserting works up from the bottom, moving each line down, whereas cutting works down from the chosen line, moving each line up. It does this by writing the line moving instructions to a TEMP procedure, which is merged and run from TEMPMERGE. Because Archive program files are simple ascii files, there is no problem about creating them in this way, provided what you create is a valid program. The proc and endproc statements need to be written, as well as the body of the procedure. There is plenty of scope for writing programs that will refuse to load, let alone fail to run correctly. However, under full program control, as used here, it provides a concise – if rather slow – solution to an otherwise longwinded problem. In use the method is completely transparent. After each line is numbered, the user is asked to enter the line to be dealt with. After a short pause, the page is redrawn, with the selected text either a line higher, if you are cutting, or a line lower, if you are inserting. The bottom line will either be created or lost, respectively.

The Sort/Select option gives the submenu offered by the PAGESORT procedure. There are four options. Three of these are straightforward, using built in Archive record-handling facilities. The remaining one takes up most of the procedure, and requires not just a TEMP procedure, but an export file as well to do its job. We shall look at the easy options first.

Sorting file records into order is something Archive was built for. Thus, as each notepad page is a single record, Archive can readily order the pages. NOTEPAD expects the pages to be ordered by page number, but option One allows you to use the TITLE$ lines as the order key, ordering in ascending alphabetical order. If you wish to impose an order other than alphabetical, you could manually enter an order number at the start of each title line. When doing this, be sure to include leading zeros for low numbers, otherwise 2 will come after 19, for example. NOTEPAD will need the file ordered by page numbers, so once the file is ordered by title, the pages are all re-numbered in the new order. This has the side-effect of making the ordering non-reversible.

Like record ordering, SELECTing particular records is well provided for in Archive. Once the select has been made, you can carry on, as though the selected records were the entire file. In this case, option three requests a word or phrase, and selects all records which include it in the TITLE$ line. This is particularly useful if you are using the notepad for Card Index type purposes. You could include keywords in the title line, to describe the contents of the page. All the entries covering a particular subject could then be selected, for browsing through, or printing out. By using multiple selects, without RESETing, the area of interest can be progressively narrowed. Alternatively you could make a more arbitrary selection, by marking each required title line, for example with a 'XXXX' entry. Then, provided it is not a database of Australian brewers, only the marked files will be selected, ready for printing out.

Reset

The RESET option is the opposite of selecting, it restores the de-selected records back into the file. RESET also destroys any ordering, so the program has to re-order by page number, for whenever NOTEPAD uses the LOCATE command.

Finally, there is the option to re-order the lines on the current page. As each line is a field of one record, Archive will not do this directly. The technique used here is to create an export file, in which each line becomes a one field record. This field is imported into a new database file, of 19 records – one for each line, and ordered alphabetically. The ordered records then need transferring back into the page. To do this, a TEMP procedure is created, which copies each record to a line in the page, in its new order – but putting all empty records at the bottom of the page. Apart from uses such as ordering a list, this could be used for major page reorganisation. Rather than multiple cuts and inserts, you can number each line in the desired order (remembering the leading zero), and have it re-ordered automatically.

Printouts

The last procedure for the NOTEPAD section is PAGEPRINT, which gives printouts of your pages. A BOX is put in the middle of the screen, and filled with the SEDIT screen developed earlier. Each variable is declared as local, and, where the default is not zero, is given a default value. SINPUT is used to obtain the actual values. The user can select the first and last page number to be printed. For a single page, enter its number in both of these. There are options to include a page number and date before each page printed; to include the title line; and to include any blank lines on the page. In these cases, "1" includes the option, "0" excludes it. Finally you decide what is to happen at the end of the page. Option "0" will carry straight on with the next page. "1" will give a one line break, and "2" will provide a fresh sheet of paper for each notepad page. The options you choose will depend on the particular purpose in mind. Printing three pages which comprise one memo on a subject will want very different settings from a card index, in which each page is a different record.

A further embellishment is added at print time, in the form of a comment facility. If a line starts with three slashes ('///') the line will be ignored by the print routine. Thus you could, for example, use a NOTEPAD file as an address book. You could then have lines for phone numbers, or what you thought about the person, without having them printed on the envelope with the name and address. There is plenty of scope for further enhancements. You may wish for more control over the margin – rather than having it fixed globally. You may wish to re-format the lines, to make them fit narrower or wider pages. You could add other end-of-page options, or other page headings. Extra facilities can be added to meet your specific needs.

That completes the NOTEPAD portion of the program. As you can see, it does rather more than simply allow you to print a short note. with imaginative use it can bring Archive's database power to bear on a range of text-handling problems. Next month we will be changing the subject away from text manipulation. We shall be be putting Archive's mathematical power under user control, in the calculator program; and adding to the existing date handling facilities, in order to provide a calendar.

DIY TOOLKIT

This month Simon Goodwin builds on existing toolkit commands, showing how one QL can enter commands and programs on a network of machines.

This column explains *Netpal*, a 'command server' which allows one QL to control others through the Sinclair network. You can type commands in a window on the master machine and they are entered and executed on the slaves. QLs are so cheap these days that this is a good way to get more performance from your system. If you have a program which needs to operate for a long time, like a fractal generator or a database format converter, you can run it on a second machine and continue in the meantime using your main micro. Thus you get a multi-processor, multi-tasking system. You can add more computers when you need extra power. That dispels the usual trade-off between multi-tasking and speed.

You could just network several machines to share files and use several monitors but QLs are cheaper than monitors and it

is common to have more computers than screens. In any case, software is often the most flexible way to switch between displays. You do not hammer away on the wrong keyboard because you have forgotten which machine is linked to the screen you are watching.

Netpal lets you enter commands for any machine on the master system. If you find the Sinclair keyboard annoying you need only upgrade the keyboard on one machine. Once Netpal is running you can type Control C to swap between machines, just as you normally swap between tasks on a single machine. Listings, directories and other information can be routed to either master or slave display channels. Alternatively you can copy the whole display from one machine to another by remote control.

The command service is called Netpal because it emulates another user through

```
1000 REMark NETPAL - the QL remote command server
1010 REMark Copyright 1990 Simon N Goodwin, v 1.0
1020 :
1030 CANCEL_ERROR
1040 back$=CHR$(194) : enter$=CHR$(10)
1050 prompt$ = "NETPAL>" : command$=""
1060 :
1070 STARTUP : HEADING
1080 REMark MAIN LOOP - adjust the second QUEUE%
1090 REMark below, if you renumber the next line!
1100 IF ERNUM
1110   PAPER #3,2 : PRINT #3;"ERROR: ";command$;
1120   PAPER #3,0 : INK #3,4 : REPORT #3 : INK #3,7
1130   CANCEL_ERROR
1140 END IF
1150 dpos%="date" INSTR prompt$
1160 IF dpos% <> 0
1170   PRINT #3;prompt$(1 TO dpos%-1);
1180   PRINT #3;DATE$;
1190   IF dpos%+3<LEN(prompt$)
1200     PRINT #3;prompt$(dpos% +4 TO);
1210   END IF
1220 ELSE
1230   PRINT #3;prompt$;
1240 END IF
1250 GETLINE command$
1260 t=QUEUE%(command$)
1270 t=QUEUE%("RUN 1100" & enter$)
1280 STOP
1290 :
1300 DEFine PROCedure HELP
1310 CLS #3 : INK #3,4
1320 PRINT #3,"NETPAL types comands on a remote QL as"
1330 PRINT #3,"if you typed them there yourself."
1340 PRINT #3,"It uses the QL network file server."
1350 PRINT #3,\"NETPAL supports all QL commands - but"
1360 PRINT #3,"it is itself written in SuperBASIC, so"
1370 PRINT #3,"NEW, LRUN, LOAD CLEAR etc. disturb it!"
1380 PRINT #3, "CTRL < is the only edit key recognised,"
1390 PRINT #3;"and you CAN'T use it to move UP a line."
1400 PRINT #3;"Don't type fast or you'll beat the net!"
1410 PRINT #3,\"PROMPT$ is the prompt, and can include"
1420 PRINT #3,"the date - for instance, try entering"
1430 INK #3,7
1440 PRINT #3,"prompt$ = 'It is now date :'";
1450 INK #3,4 :PRINT #3;" or "; : INK #3,7
1460 PRINT #3,"= ''" : INK #3,4
1470 PRINT #3,\"Channel #3 is the remote display. Try:"
1480 INK #3,7
1490 PRINT #3,"STAT #3"; : INK #3,4 : PRINT #3," or ";
1500 INK #3,7 : PRINT #3,"RECOL #3,7,6,5,4,3,2,1,0"
1510 INK #3,4 : PRINT #3,"The command "; : INK #3,7
1520 PRINT #3,"PIX "; : INK #3,4
1530 PRINT #3;"reads the other screen."
1540 INK #3,7 : PRINT #3
1550 END DEFine
1560 :
1570 DEFine PROCedure STARTUP
1580 OPEN #3,n1_con_480x200a32x4
1590 END DEFine
1600 :
```

```
1610 DEFine PROCedure HEADING
1620 CLS #3 : CSIZE #3,2,1
1630 PRINT #3,"QL NETPAL v 1.0" : CSIZE #3,0,0
1640 PRINT #3;"Enter HELP for HELP." : INK #3,7
1650 END DEFine
1660 :
```

```
2000 DEFine PROCedure CANCEL_ERROR
2010 REMark This clears the BASIC system variable
2020 REMark ERLIN once an error has been reported.
2030 REMark The DIY Toolkit BPOKE version is:
2040 FOR p=194 TO 197 : BPOKE p,0
2050 END DEFine
2060 :

2000 DEFine PROCedure CANCEL_ERROR
2010 REMark Line 2030 needs TURBO TOOLKIT, and
2020 REMark assumes BASIC sysvars occupy 256 bytes.
2030 POKE_L BASIC_POINTER(0)-256+194,0
2040 END DEFine
2050 :
```

```
3000 DEFine PROCedure GETLINE(txt$)
3010 LOCal key$,txtlen
3020 txt$=""
3030 REPeat getkey
3040   key$=INKEY$(#3,-1)
3050   txtlen=LEN(txt$)
3060   IF key$ = back$
3070     IF txtlen > 0
3080       REMark Move remote cursor back 2 places
3090       CLS #3,115 : CLS #3,115
3100       REMark Wipe out deleted character & splodge
3110       PRINT #3,"  ";
3120       REMark Move cursor to end of remaining text
3130       CLS #3,115 : CLS #3,115
3140     END IF
3150     SELect ON txtlen
3160       =0 : CLS #3,115 : PRINT #3," "; : CLS #3,115
3170       =1 : txt$=""
3180       =REMAINDER : txt$=txt$(1 TO LEN(txt$)-1)
3190     END SELect
3200     ELSE txt$=txt$ & key$
3210   END IF
3220   IF key$=enter$ : RETurn txt$ & key$
3230 END REPeat getkey
3240 END DEFine
3250 :
```

```
3000 DEFine PROCedure GETLINE(txt$)
3010 LOCal key$,txtlen%,scrub%,blank,temp
3020 txt$=""
3030 REPeat get_key
3040   key$=INKEY$(#3,-1)
3050   scrub%=0 : REMark No characters to be deleted yet
3060   REPeat do_keys
3070     txtlen%=LEN(txt$)
3080     IF key$ = back$
3090       IF txtlen% > 0 : scrub%=scrub%+1
3100       SELect ON txtlen%
3110         =0 : temp=IO_TRAP(#3,19) : PRINT #3;" ";
3120              temp=IO_TRAP(#3,19)
3130         =1 : txt$=""
3140         =REMAINDER : txt$=txt$(1 TO LEN(txt$)-1)
3150       END SELect
3160     ELSE txt$=txt$ & key$
3170     END IF
3180     IF key$=enter$ : EXIT get_key
3190     REMark Check for type-ahead
3200     key$=INKEY$(#3,0) :IF LEN(key$)=0 :EXIT do_keys
3210   END REPeat do_keys
```

the network. The master and slave machines may be QLs or any model of Thor.

The versions listed feature optional 'help' messages and are easy to adapt or extend. All the code is written in SuperBasic, using a handful of Toolkit commands. You can even LIST and alter lines of the program remotely.

I developed the program in a modular fashion to take advantage of any Toolkits you own. The main requirement is *Toolkit 2*, for the improved network driver. The slave machines need QUEUE% and BPOKE from past *DIY Toolkit* columns, or alternatively TYPE_IN and BASIC_POINTER from *Turbo Toolkit*. You gain extra speed or other advantages by using special features of *Minerva* and Turbo but you do not need them to make Netpal work.

You must have two or more computers, with Toolkit 2 network improvements on each. That should not be difficult to arrange; many QL owners have a back-up machine or already run a small network. Spare QL prices start at £65; the pieces that run programs are substantially cheaper, if you can operate without the case and Microdrives. In any case the programs illustrate neat techniques for lone machines as well as networks.

The standard QL net device does not allow flexible communication between computers but Thors have a built-in file-server. QL users need to add the rom version of Toolkit 2; the configurable ram version lacks network facilities. Care Electronics sell Toolkit 2 in a cartridge which fits the rom socket behind the QL keyboard. The full Toolkit rom is included in some *SuperQboards* and the *Trump Card* and *Disk Card* from Miracle Systems.

Master

The master machine is the one where you enter commands for all the computers on the network. A machine which accepts its commands from the network is called a slave. All slaves must LRUN NETPAL after the master starts the file server with the FSERVE command.

In the following explanation, the local computer is the one running the program or command in question. The remote machine is the other one. Netpal opens a remote window on the screen of the computer which is file serving. You could keep NETPAL in eprom, so that it starts as soon as you press F1 or F2 on each slave, so long as you have spare rom sockets on the slaves. You will need an eprom programmer and a package like *RPM* or *Eprom Manager* to put the Basic listing into a ROM BOOT file.

The file server allows slaves to use any device on the master by prefixing the device name with N, then the master station number and an underscore. Thus STAT N1_WIN1_ causes the slave computer to display the drive statistics for

```
3220    FOR blank=1 TO scrub%
3230      temp=IO_TRAP(#3,19)+IO_TRAP(#3,19)
3240      PRINT #3,"  ";
3250      temp=IO_TRAP(#3,19)+IO_TRAP(#3,19)
3260    END FOR blank
3270  END REPeat get_key
3280  RETurn txt$ & enter$
3290  END DEFine
3300  :
```

```
4000 DEFine PROCedure PIX
4010 REMark Copies a screen over the network.
4020 REMark This needs a MEM device on the other QL.
4030 REMark Add %s after ROW & COL if using Minerva.
4040 LOCal p,row,col,temp$
4050 INK #3,4
4060 PRINT #3;\\\\\"Loading other display... check MODE!"
4070 PRINT #3;\"Wait to see the whole display, then"
4080 PRINT #3;"press ENTER to re-start command entry."
4090 OPEN #3,"n1_mem"
4100 LET p=131072 : REMark Assumed base of 32K screen
4110 PUT #3\p
4120 FOR row=0 TO 255
4130   FOR col=row*128 TO row*128+127 STEP 2
4140     PUT #3,PEEK_W(p+col) : REMark Very slow for 32K!
4150   END FOR col
4160 END FOR row
4170 STARTUP
4180 INPUT #3,temp$
4190 HEADING
4200 END DEFine
```

```
4000 DEFine PROCedure PIX
4010 LOCal p,row,temp$
4020 INK #3,4
4030 PRINT #3;\\\\\"Loading other display... check MODE!"
4040 PRINT #3;\"Wait to see the whole display, then"
4050 PRINT #3;"press ENTER to re-start command entry."
4060 OPEN #3,"n1_mem"
4070 LET p=131072 : PUT #3\p
4080 FOR row=0 TO 255
4090   PRINT #3,PEEK$(p+row*128,128);
4100 END FOR row%
4110 STARTUP
4120 INPUT #3,temp$
4130 HEADING
4140 END DEFine
```

the master machine's hard disc 1, assuming the master is net station 1.

You can call any SuperBasic procedure on the other machine. Try HELP, HEADING or PIX. Beware of NEW, LOAD, LRUN and other commands which change the contents of Basic. They work but may stop the slave accepting further commands if they over-write part of Netpal.

The command prompt is normally 'NETPAL>' but you can change it by assigning to the variable PROMPT$, over the net. The date and time is inserted into the prompt in place of the text 'date', so you can see when the prompt was issued, like MS-DOS.

The prompt uses local time, showing the time on the remote machine rather than the master. This will not matter much unless your network lead runs over a national boundary or the International Date Line. You can always enter an SDATE command over the net if you want to adjust the clock on the slave machine.

Listing one is the main part of Netpal. It uses the DIY Toolkit function QUEUE% and the Toolkit 2 extensions ERNUM and REPORT. Turbo owners may use TYPE_IN instead of QUEUE%. There is no check on the value returned by QUEUE%, as there should always be space in the input buffer for the text returned by GETLINE.

The HELP procedure is optional but useful. If you type HELP in the remote window on the master machine, Netpal enters the command on the slave. This causes the HELP procedure to run as if you had typed HELP on the slave but HELP sends all its output to channel #3, the remote window. The effect is that typing HELP on the master produces a page of instructions in the remote window. Take the second PRINT out of PROC HEADING if you decide not to type in the HELP.

STARTUP and HEADING are simple procedures called by the main program. STARTUP opens a channel over the network. It presumes that the master machine is network station 1, the default. Alter the OPEN parameter to move or resize the remote window. You can do this remotely by typing a new line 1580, then 'RUN'. LIST #3 lists to the remote window but ED and EDIT #3 give 'bad parameter'. You must type FSERVE on the master before STARTUP is called but there is no need to load any program on the master. The file server and network window use only 1.5K of memory between them.

Choose

The rest of the program is in listings two, three and four. Each contains two versions of one procedure, designed to suit different toolkits and system configurations. It is for you to choose one procedure from each listing and tack that on to the main code from **listing one**. The options in **listings two, three and four** are described next.

In listing two, when a SuperBasic error is detected the error code is stored in the SuperBasic system variable BV.ERNUM, at offset 194 in the SuperBasic area. Netpal reads this with the function ERNUM and if it is not zero it uses REPORT #3 to send the appropriate error message to the remote window. Unfortunately, I cannot find a standard way to cancel the error code once it has been reported. SuperBasic stores the new code when another error occurs but BV.ERNUM still holds the old error code after a successful command.

CANCEL_ERROR is used when Netpal starts to run and after each subsequent error is reported. It is not needed if you do not mind spurious reports after an error occurs but Netpal is more friendly if you include it. You must remove the calls to CANCEL_ERROR in listing one if you want to leave out that procedure.

Listing two shows two versions of CANCEL_ERROR. Once uses the DIY Toolkit command BPOKE; you can avoid the need for the loop if you have BPOKE_L. The alternative makes rather suspect use of BASIC_POINTER from Turbo Toolkit. Beware that this version is likely to fail unpredictably if a task starts or stops as the POKE_L command is

executed. See the December, 1988 *QL World* for an explanation of the problem and the BPOKE listing.

Listing three contains GETLINE, which is in many ways the core of Netpal. It accepts and echoes commands for the slaves on the screen of the master computer, keeping the latest edited version of the line on the slave machine. This should be simple. In theory, INPUT #3,txt$ should allow a line to be entered and edited in the remote window. In practice, Toolkit 2 does not handle net INPUT properly. You can enter characters as normal but the screen is messed up if you make a mistake.

It you try to move the cursor, a succession of splodges will appear and the cursor stays at the end of the line. Likewise CTRL LEFT and CRTL RIGHT produces splodges on screen, without deleting other characters from the display. The text is edited but all the control characters appear as splodges and you cannot move the cursor in the line.

GETLINE is the answer, a simple procedure which reads a character at a time, keeping the remote screen tidy as characters are entered or deleted. You can enter up to one screen line; characters are stored but not displayed once you reach the right-hand margin.

The only editing key allowed is CTRL-LEFT, to delete to the left. ALT ENTER works as usual, recalling previous lines entered in that window. The first version is aimed at QL users. It uses the undocumented instruction CLS 115 to move the cursor left. CLS 115 calls the Qdos routine SD.PCOL.

If you press CTRL-LEFT the computer remote-prints a splodge which corresponds to CHR$(194), the delete left code. GETLINE tidies by calling SD.PCOL twice and printing two spaces. This overwrites the splodge and the character before it. Another two calls to SD.PCOL leave the cursor at the end of what is left of the line.

This works well, until you try to delete several characters in quick succession. The network sends a 'packet' of data for each keypress and another for each PRINT or call to PCOL. If you type CTRL-LEFT, say five times, fast, the net must send five INKEY$ packets, five pairs of spaces and 20 calls to SD.PCOL. The QL cannot cope with 30 packets send in opposite directions in a fraction of a second. Some are lost and the display gets out of step with the stored text.

For that reason you should wait to see the cursor move when deleting each character. Incorrect lines are sent back through the net when an error occurs, so you can see what the other machine received if an error occurs.

The second version of GETLINE uses 'lazy' code, like Chas Dillon's EDITOR task. It postpones updating the screen if characters are still arriving from the remote keyboard. Thus characters are not lost but the first effect of typing CTRL-LEFT five times is that five splodges appear; as soon as you stop typing the cursor will race around, deleting the last 10 characters.

Current Thor XVI ROMs do not allow CLS 115 but they have a new function IO_ TRAP to call SD.PCOL. The second version of GETLINE uses IO_TRAP to call SD.PCOL. You may need IO_TRAP in place of CLS 115 if running the first version on a Thor XVI. Use CLS 115 instead of IO_TRAP if you want to use the 'lazy' version on a QL.

GETLINE returns the result in the variable TXT$. Add REFERENCE txt$ before the DEF PROC if you want to compile the procedure with Turbo.

In theory, GETLINE could be expanded to allow full line editing, with left and right arrows working as normal. This would need a relatively big routine on the slave machine, using cursor movement calls, printing new characters and panning part of the line to get rid of deletions.

Code to handle multi-line entries would be more tricky and would cause so much network traffic that it might be better to run a separate editing program on the master machine, rather than keep the partly-edited text on the slave and display changes on the master.

Line delete

There is one improvement which could easily be added; character 195, CTRL ALT LEFT, is often used to delete the entire line in QL editors. It is worth adding this to GETLINE, as CTRL LEFT can be slow or messy if used repeatedly.

Once GETLINE recognises CHR$(195) it can forget the line with TXT$="". Tidying the remote screen is more difficult. We could just eliminate characters one at a time, moving the cursor left twice and printing one space for the splodge and each character entered previously, but that is very slow. It is better to use special Qdos routines if we can get at them from Basic.

TRAP #3 with DO=17 (SD.TAB) moves the cursor in a window to the column specified in D1. On recent Thors we can do this with:

```
t=IO_TRAP(#3,17,0)
```

SD.TAB is not available officially from SuperBasic on earlier machines but I have managed to access it by passing weird parameters to PAN. On a standard QL or early Thor, PAN #3,0,118 moves the cursor directly to column 0. Finally, clear the whole line with the standard command CLS #3,3.

In listing form, PIX copies the screen display from the slave to the master. It needs the MEM device from DIY Toolkit July and August, 1989 on the master machine, as it stores bytes directly in the master screen memory. The code could be adapted to work the other way, using MEM to read the slave screen, if you prefer to load MEM on each slave and leave it off the master.

A message appears before the screen is sent, so you can change MODE if necessary. The code works with MODE 4, MODE 8 and the Thor MODE 12 but you get strange flashing effects if you load a MODE 4 or MODE 12 screen with MODE 8 selected on the master. The MODE should be the same on both machines. MODE 8 and MODE 12 screens appear in four colours, with extra stipples, if loaded with MODE 4 set on the master machine.

There are two versions of PIX in listing form. The fast one uses the PEEK# function to read the display a line at a time. This function first appeared in Turbo Toolkit and has since occurred in others. The alternative relies on the standard PEEK_W and PUT from Toolkit 2; it is slow because it transfers the screen two bytes at a time, as 16,384 word-sized portions.

Netpal is useful but it has limitations which stem from the Basic implementation and the underlying QL design. These are the snags I have found and my suggestions to circumvent them.

There is no way to send Control F5, Control Space or Control C. This is a fault of all Qdos systems. It means you cannot type those characters over the network unless you write a special program to perform their effects locally when they are read over the network.

Qdos deals with these special characters as soon as they are read from the second processor, without putting them in the keyboard queue first. Thus they have no effect even in QUEUE% or TYPE_IN enter the correct characters. Without Control C it is difficult to swap between tasks. QL roms from JS onwards try to swap automatically when a new task is loaded or the current one stops but sometimes they get lost.

Tasks do not normally open windows over the network. Prompts and displays appear on the slave, not the master screen, and you cannot use Control C to swap to the Basic command line and enter PIX to see the whole screen.

You could patch programs to open channels over the net by changing the device name used when the channel is opened but some tasks open windows with the vectored utilities UT.SCR or UT.CON and those system routines always use the local display. Even if you open windows over the net you run into restrictions imposed by the network file server. FSERVE works hard but it is slow and can become confused if the net is busy.

FSERVE does not implement some facilities. Editing characters appear as splodges if tasks use INPUT or IO.EDLIN. SD.EXTOP is used in DIY Toolkit to circumvent the changes imposed by window management software. Toolkit commands which use EXTOP will not work if directed at a window on another machine.

The server will not let you set fonts

remotely with SD.FOUNT although you can use Netpal to type-in commands to load and link a font on the slave machine. The problem with EXTOP and FOUNT is that they expect the window to read further code or data from a specified address on the machine issuing the call. This is impracticable when the window and the memory are on different machines.

Netpal works best if you can build it into the program you want to control. That still leaves much scope for programming in SuperBasic or any compiled language which can open a net channel and the unmodified program gives access to all SuperBasic commands on a remote machine.

The code CTRL-F5 normally freezes the screen. That can cause problems with Netpal because of a bug in Toolkit 2, which does not handle remote CON channels properly. Normally it freezes the screen after each page is displayed by commands like VIEW, WDIR and WSTAT, so information does not scroll off the screen until you press a key. Toolkit 2 also re-defines the DIR command to work like WDIR.

That would be satisfactory but QJump freezes the local screen after those commands even if they are directing output to another machine over the network. Thus you can enter WSTAT #3 in the remote window and the first part of the directory will appear. You can pause it at the master keyboard in the usual way with CTRL-F5.

If it is a long directory output will stop after a time as Toolkit 2 pauses, waiting for a keypress on the slave machine. Netpal will not be able to prompt for another command until the 'scroll lock' flag in the slave machine is cleared, so you have to press a key on the slave to regain control.

The QJump FIXPF utility may help, by restoring the old code for DIR, which scrolls freely. Alternatively you might compile a low-priority task to run on the slave machine, clearing the CTRL-F5 flag SV.SCRST periodically.

Screen output is frozen while this byte is not zero. You can unfreeze the screen with POKE SYSBASE+51,0. This task will consume negligible processing power if you arrange for it to suspend itself for a second or so between POKEs.

Some errors are difficult to trap, as they cause the line to be re-displayed fo editing. 'Bad line' errors occur if you enter an invalid line number or have keyword syntax incorrect, as in: 'GO now', 'END SELect thing' or 'PRINT 'Hi"'.

The best cure is to use *Minerva*, or you will need to lean over and press CTRL-SPACE if you enter a bad line and the slave gets stuck. Minerva users can avoid this with one extra line:

```
1265 dummy%=QUEUE%(CHR$(27))
```

This types-in an ESCAPE character which interrupts the Minerva line editor if the remote command is rejected and re-represented for editing. It may be possible to simulate CTRL-SPACE from a compiled task by clearing BV.BREAK asynchronously with BPOKE 143,0 but it is difficult to know when to do it, as 'Bad line' errors do not set ERNUM.

Netpal pushes the QL network to its limit but it is interesting and fun. I am keen to hear from readers who have Netpal useful and compiled or extended the listings presented.

If you have difficulty, re-read the text. I have tried to anticipate the most likely difficulties. If you are still stuck I shall try to help if you send me a listing of the program as you have entered it and say which roms and toolkits you have loaded on each machine.

● *DIY Toolkit is a tutorial series which shows how the QL system can be extended and improved. Send your suggestions if you would like me to explore a specific area in this column or to implement new and original commands.*

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SUPER BASIC

Some of the best things in life are small and powerful. Mike Lloyd introduces a batch of statistical functions which meet this description perfectly.

Basic is supposed to be a "general purpose" programming language, unlike "scientific" Fortran, "business-oriented" Cobol and "serious-programmers-only" C. This means that Basic shares many of the strengths of other languages without necessarily having the same weaknesses. However, a quick look at the list of reserved keywords for SuperBasic shows that many functions which would be of widespread use are missing, although arcane trigonometric functions seems to abound. The reasons behind the glut of trig functions are that they are essential to make full use of graphics, they are best programmed in machine code rather than in slow Basic and that once the code has been developed for the straightforward sines, cosines and tangents it takes little more memory to include the likes of the more esoteric atangent.

Easy to define

Functions which might make a programmer's task easier when tackling more mundane problems are not present in SuperBasic usually because they are easy for the user to define and because, were they to be included in the QL's rom, other parts of the language would have to be removed to make room for them. The absence of SGN, a function normally found in other Basic dialects, is a case in point. SGN is an abbreviation of *signum* and the function takes a numeric value as its parameter, returning −1 if the value is negative, 0 if the value is zero and +1 if the value is positive. Thanks to the presence of user-defined functions in SuperBasic the omission of SGN can quickly be put right with:

```
100 DEFine FuNction SGN (x)
110 RETurn 1 - (x<=0) - (x<0)
120 END DEFine
```

This has, for me, all of the hallmarks of a classic function definition. The algorithm is reduced to a single line of executable code, it has an elegant simplicity and there are no special cases or ugly exceptions to account for. It not only works reliably but the code actually looks attractive.

Other functions are not so appealing to minimalists, but they nonetheless perform a useful job with efficiency. For instance, **Listing 1** will produce the total value of all of the elements of any single-dimensioned numeric array passed to it. The slight amendments necessary to summate multi-dimensioned arrays are left for readers to discover for themselves.

Along with the sum of a string of figures it is often necessary to calculate an average and some idea of the statistical spread of the values. Statisticians will need no reminding that what we commonly call the average figure might be calculated in one of three ways, each

Listing 1

```
100 DEFine FuNction Sum (d)
110   LOCal Total, Value
120   Total = 0
130   FOR Value = 1 TO DIMN(d)
140     Total = Total + d(Value)
150   END FOR Value
160   RETurn Total
170 END DEFine
```

Listing 2

```
200 DEFine PROCedure Sort (d)
205   LOCal Ptr1, Ptr2, Temp, Flag
210   FOR Ptr1 = 1 TO DIMN(d)-1
215     Flag = 1
220     FOR Ptr2 = 1 TO DIMN(d)-Ptr1
225       IF d(Ptr2) > d(Ptr2+1)
230         Flag = 0
235         Temp = d(Ptr2)
240         d(Ptr2) = d(Ptr2+1)
245         d(Ptr2+1) = Temp
250       END IF
255     END FOR Ptr2
260     IF Flag = 1: RETurn
265   END FOR Ptr1
270 END DEFine
```

Listing 3

```
300 DEFine FuNction Median (d)
310   Sort d
320   RETurn d(DIMN(d)/2)
330 END DEFine
```

producing a different value and each purporting to be a representative average. Unfortunately, two of the methods demand that the array they work on be sorted into numeric order. A simple sorting routine has been included at **listing 2** but it can be replaced with another routine if preferred.

Listing 2 is a bubble sort which takes a numeric array as its only parameter. Bubble sorts are always slow, but this one has the advantage of setting a flag if no swaps have taken place in a loop through the values. If no swaps have taken place then the list must be in order, so in some cases this routine will finish earlier than the bubble sorts which blindly proceed to check every pair of values even when no swapping is taking place. This attribute is particularly useful when arrays which might already be sorted are passed to the routine because sorting is aborted after the first pass through a list of sorted values.

To return to the subject at hand, **Listing 3** calculates the median value of an array. The median is the central value in a group of sorted figures. To find it, an array needs to be sorted and then the value nearest the middle of the array is found. For arrays with an even number of elements the lower of the two possible contenders for the "middle" position is used. The DIMN function is used in the definition to reveal the number of elements in the array and so it is worth noting that blank elements are significant in calculating this and other statistical values. If the situation arises where a group of ten figures are stored in an array which can accommodate 100 values it will be necessary to move the valid figures into a smaller array before passing them to any of the statistical functions.

Listing 4

```
400 DEFine FuNction Smode (d)
405   LOCal Current, Most, Value, x
410   Sort d
415   Most = 0: Current = 1
420   FOR x = 1 TO DIMN(d)-1
425     IF d(x) = d(x+1)
430       Current = Current+1
435     ELSE
440       IF Current > Most
445         Most = Current: Value = d(x-1)
450       END IF
455       Current = 1
460     END IF
465   END FOR x
470   RETurn Value
475 END DEFine
```

Listing 5

```
500 DEFine FuNction Mean (d)
510   RETurn Sum(d)/DIMN(d)
520 END DEFine
```

Listing 6

```
600 DEFine FuNction Sd (d)
610   LOCal x, dMean, Var(DIMN(d))
620   dMean = Mean (d)
630   FOR x = 1 TO DIMN(d)
640     Var(x) = (d(x)-dMean)^2
650   END FOR x
660   RETurn SQRT(Sum(Var)/DIMN(d))
670 END DEFine
```

Above and below

The median is useful in that it breaks a group of figures into two equally-sized classes, those above the average and those below the average. There may be some fluctuation in the actual numbers if the median figure occurs often in the set of data. The simplicity of the definition of the median can lead the unwary into logic traps such as complaining that half the working population earn less than the median wage when this is bound to be true except in the unreal situation where everyone earns exactly the same amount.

The mode of a group of figures is the value which occurs most often. Where data is continuous rather than discrete no value might occur more than once, in which case modal classes are defined to group together similar values. For the purposes of this article the values accepted by the function Smode ("mode" itself being a reserved keyword) are assumed to be either discrete or a count of the entries in a set of modal classes.

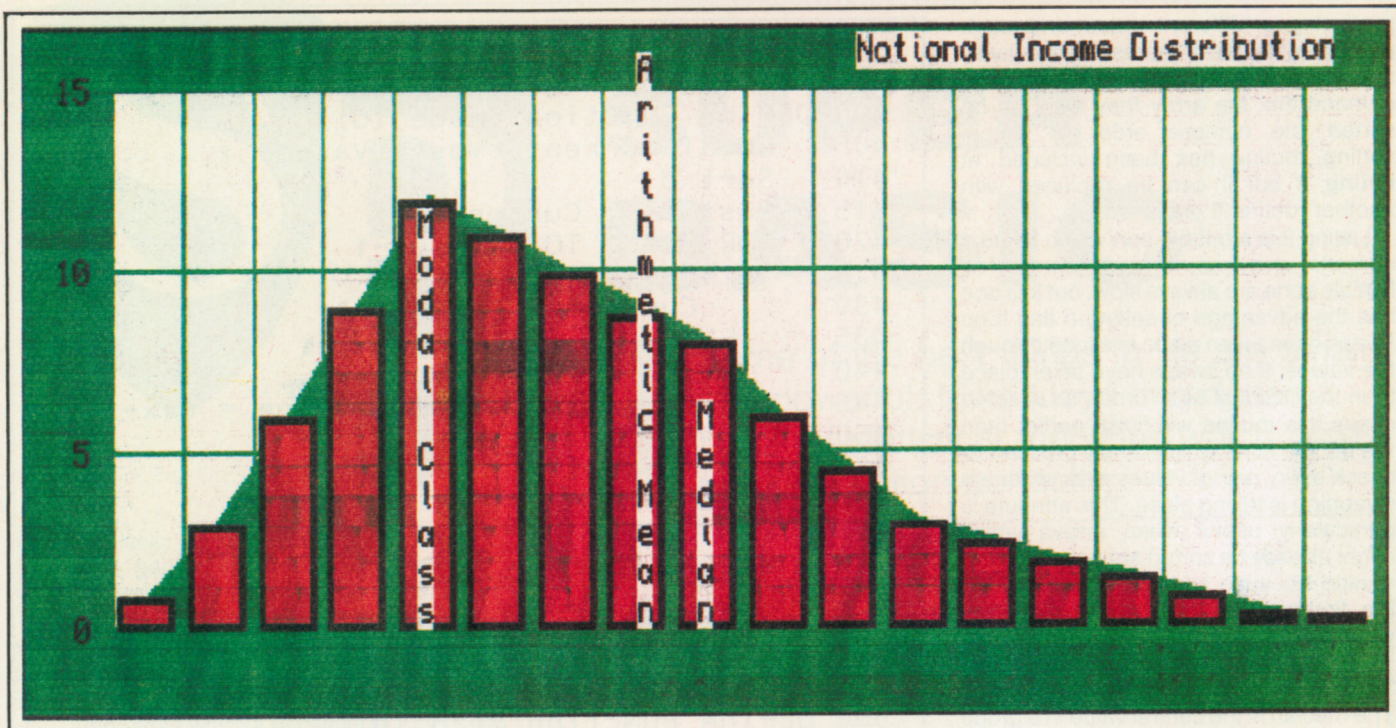
Listing 4 works by sorting a numeric array into order and then passing once through the values. Each value is compared with its successor and, if they are the same, a counter is incremented. When they fail to match then a complete set of identical values has been counted. If the count exceeds the previous highest count then the new mode replaces the old. At the end of the process the Value variable holds the value which occurs most frequently in the set of data, and this is returned to the calling expression.

The mode of a group of figures is often what is meant when people use the word "average" in normal conversation. The "average" family car is the type owned by most families, the "average" family has two children, not 2.75, and so on. The mode tends to be misleading when a set of values is distributed around two or more modal peaks. For example, a survey of average adult heights will reveal two peaks, one commonest among men and the other among women. A simple mode is in danger of seriously misrepresenting the overall distribution pattern of a set of data.

In statistical circles the word "average" is most often assumed to represent the arithmetic mean of a set of figures, in other words the average is found by adding all the figures together and dividing by the total number of values. The mean can be calculated from an unsorted list of values but it needs the *Sum* function to find the correct answer. **Listing 5** shows how what is apparently the most complicated algorithm can be reduced to a single statement.

It is the arithmetic mean which is confused with modal values to give apparently spurious statistics, such as the average family having 2.75 children. The mean is most useful when it refers to a group of continuous values which fall into some sort of pattern, such as monthly earnings. Earning patterns are known to be "skewed", in other words, the majority of wage earners are found in a clump towards the lower values and there is a slowly tapering tail extending up to the highest income levels.

This is demonstrated by the graph of notional values at **Figure 1.** The median, mean and mode point to very different groups of earners even though each one



of them can fairly be described as the "average". The largest group of similarly-paid workers are highlighted as the median class, but they get paid substantially less than an equal share of the company's wages bill. However, the income group exactly half-way between the lowest-paid group and the highest-paid group are paid *more* than the arithmetic mean. The situation is set for a confrontation between the management's statisticians and the union's statisticians about the fairness of the company's wages policy.

Identifying the average value, however, it might be defined, of a group of figures still leaves questions unanswered. How, for instance, are the individual values arranged around the mean? Sometimes figures can be grouped very close to the average value and sometimes there might be a substantial number of values at the extremes of the data set's boundaries. A pair of cake-making machines might, for example, produce cakes which average twelves ounces in weight, but the one machine might occasionally produce cakes weighing less than ten ounces or more than fourteen ounces while the other's cakes never vary by more than an ounce. Despite sharing the same arithmetic mean, therefore, the output of the two machines are radically different in terms of accurately producing the target weight.

What is required is some means of describing the average disparity between a typical value and the average for all related values. One method is to calculate the *standard deviation* for the data set. In order to do this the arithmetic mean for the figures is calculated and the difference between each value and the mean is recorded. These differences are squared in order to remove negative values and give a weighting to extreme values. The squared differences are added together and divided by the number of values in the data set. The square root of this value is the required standard deviation.

Only five lines

Remarkably, such a long-winded operation, which can take hours to accomplish by hand, takes only five executable lines to implement in SuperBasic (see **Listing 6**), provided of course that the two subsidiary functions have already been entered. The mean of the array of values is found simply by calling the function at Listing 5. A loop is then estalished to access each value in turn, finding the difference between it and the mean, squaring the difference and storing the result in a locally-defined array. After the loop is completed the square root of the sum of the variations divided by the number of elements in the array is returned as the result.

Unfortunately, the figure obtained for the standard deviation is closely related to the units which the values represent. To compare, say, the standard deviation of the weight of a hundred cakes with the standard deviation of the thickness of 1,000 portions of sliced meat a more sophisticated measure is required. The co-efficient of variance reduces standard deviations to figures between nought and one, representing zero variance and infinite variance respectively. By multiplying the co-efficient of variane by 100 a percentage-like figure can be obtained which can then be used for comparisons between different sets of data.

Listing 7 calculates the co-efficient of variance by dividing the standard deviation

```
Listing 7

700 DEFine FuNction CV (d)
710   RETurn Sd(d)/Mean(d)*100
720 END DEFine
```

```
Listing 8

800 DEFine FuNction FRQ (Value, d)
810   LOCal Total, x
820   Total = 0
830   FOR x = 1 TO DIMN(d)
840     IF d(x) = Value: TotaJ = Total + 1
850   END FOR x
860   RETurn Total
870 END DEFine
```

```
Listing 9
900 DEFine PROCedure demo
905   DIM array(30)
910   FOR x = 1 TO 30: array(x) = RND(9)
915   FOR x = 1 TO 30: PRINT array(x)!!
920   PRINT
925   Sort array
930   FOR x = 1 TO 30: PRINT array(x)!!
935   PRINT\\"Median = "; Median (array)
940   PRINT  "Mode   = "; Smode (array)
945   PRINT  "Mean   = "; Mean (array)
950   PRINT  "Standard Deviation       = "; Sd (array)
955   PRINT  "Co-efficient of Variance = "; CV (array)\
\
960 END DEFine
```

of an array of figures by the arithmetic mean and then multiplying the result by 100. The function might be reduced to a single executable line but its elegance hides a lack of efficiency: the arithmetic mean is calculated once in the SD function and again in the CV function. Were this function to be used repeatedly or with large data sets it would be better to copy the SD function and add to the RETurn statement to calculate the coefficient rather than the standard deviation.

When a set of figures is examined it might be useful to find out the frequency with which a particular value occurs. The Smode function does this, of course, but only for the most frequently-occurring value and then only if the data set is ordered.

Listing 8 shows a function which meets this need. It takes two parameters, the array to be searched and the value to be counted.

A single pass is then made of all the values in the array with every occurence of the target value causing a counter to be incremented. When every value has been examined the final count is returned to the calling expression.

If it was known at the outset that the values in the array were sorted into order it would be possible to speed this function by using a binary chop technique to find the required values more quickly, but the extra programming and the reduced functionality rarely make this worthwhile. If the array contained continuous data it would be necessary to alter the FRQ function so that values falling within a specified range were counted.

Listing 9 is a simple demonstration routine which creates an array of dummy data and analyses it. Finally, a reminder to Turbo users: Turbo does not normally permit the passing of arrays to procedures or functions and so most of the code listed here will need to be added to if it is to be compiled successfully with Turbo. Section P of the Turbo manual describes how the REFERENCE statement is used to overcome this limitation.

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Neil Daglish started with an injury brought on by overwork and ended with a QL and an Archive sorting procedure to make lighter work of his researches.

ONE MANS SYSTEM

One of the problems facing me when I returned from eight months' study and research leave in English archive centres in 1984 was a form of repetitive strain injury brought on by the massive amount of handwriting I had had to do. The specialist suggested using a keyboard to overcome the problem, but was my ancient portable typewriter the answer? A possible solution emerged at a meeting of all academic staff some weeks later. In the course of presentations on the possible uses and benefits of computing it was hinted that we should all become computer literate as soon as possible, given the demands future undergraduates, already computer literate, would place on us and the rest of the university system. Clearly, for both medical and professional reasons, the time had come for me to enter the world of computing and computers.

A hastily-acquired and sketchy knowledge of basic computing terms, not least to be able to understand salespersons' jargon, was sufficient to reveal the (then) staggering power of the QL. This, my perceptions of the potential of *Quill* and *Archive* plus the murmured hints about multi-tasking became the decisive factors in purchasing a QL in August 1985. The ability to produce several drafts of a book review in one morning on Quill (V2.3), only a day after acquiring the machine, seemed to augure well for the future.

Lockups

Six months later, after the rather more sobering experiences of faulty microdrives, Quill lockups and other QL niceties, the replacement D15 JS machine was equipped with a CST interface and a single Mitsubishi 3.5in. drive: *QL World* was acquired regularly and I had joined Quanta. Not completely error free, the disc drive did at least minimise the appearance of the spine-chilling message of 'bad or changed medium'. Removal and then refitting the same ZX8301 chip, or replacing it with another ZX8301 chip, appeared effective in combating the lockup syndrome. The two journals have proved very important in their demonstration of the QL's tremendous potential, as well as the reviews of hardware and software all of which it is impossible to preview/try here. Albeit a complete beginner, I had become a QL afficionado fast!

Today, our household has three QLs, all JS versions; one, a basic JS, resides in my office: the second, with 768K Trumpcard and twin NEC 3.5in. drives is in my study at home while the third, with a 512K SuperQBoard and twin NEC drives ensures that my wife and son can always have access to a computer. The interfaces and disc drives have proved themselves totally reliable as has the Epson LX80 printer employed. All the QLs are used with Mitsubishi amber monochrome monitors while a Tandata QConnect modem allows access to bulletin boards and databases.

My main uses of the QL revolve around writing lectures, reports, articles, many in conjunction with a database of my historical research material. After working with Quill (V2.3 and 2.35), *TurboQuill* and *Editor* all wordprocessing is now done with *Text*^{87} (V2.00), a superbly fast, sophisticated yet flexible and highly reliable piece of software. The different line spacings required in academic articles, with their drastic effects upon pagination, are an impossibility with Quill but mere routine with Text^{87}. After some very useful advice and help from Tony Tebby, *QRAM* has replaced Taskmaster for multi-tasking and other 'housekeeping' tasks. Speedscreen and Timeout [*QL World*, May 1989, p.21] accompany these and other program is use, to great effect. Archive (now V2.38), however, has not been replaced and the greatest challenge has been the writing of procedures to optimise the use of the database, a task not aided by the cryptic, if at at times enigmatic, QL manual.

The first hurdle in constructing the database was to decide upon a file record structure best suited to my needs. This, in turn, was dependent upon the screen displays possible within Archive. I soon discovered that in order to learn what was possible or available in Archive meant going outside the QL manual and here Mike O'Reilly's *Database Management on the Sinclair QL*, Charles Dillon's *Notes on Psion's QL Archive* [Quanta 1985] and some Quanta library programmes proved to be very useful, not least in providing an understanding of the Archive section of the QL manual. Despite the relative paucity of articles in Quanta and *QL World* on Archive, demonstrating perhaps that Archive users are either a very self-sufficient breed or thin on the ground, some very useful gems have appeared in print, eg line concatenation, reinforcing once more the limitations of the QL manual.

After various trials I decided that the most effective file record structure would be one allowing a synopsis of each research item, keywords to allow broad or detailed trawls for related items in a file or files, and sufficient details to cover the authorship of letters, reports, articles and books. The record was designed, equally importantly, to permit rapid and precise access to the material stored in my filing cabinets and ring binders as well as in journal articles and books. The discovery, via Quanta, that one can concatenate up to three (almost complete) screen width lines for each field (ie, a maximum of 255 characters) when designing a screen in Sedit allowed me to use only 15 fields per record to provide all the required data and yet fit onto one screen. With the exception of the record number each field, including the dates of writing/contents/publication, is a string. This was done so as to allow for the greatest flexibility when using Archive's search and order commands.

Concatenation

It almost goes without saying that the QL manual completely ignores line concatenation, so here is a brief description. When designing a screen in Sedit and having entered the variable for a field (eg, v$ or author$) when prompted by Archive you are asked to indicate the space to be allocated for the variable, using the space bar. Before doing this press the right cursor key to move one space (dot) to the right and then press the down cursor key once or twice – for two or three lines – for that variable. Then use the space bar as normal to fill in the amount of horizontal space required for each of the lines. Not only can you now use more than a line for one variable but there is the added bonus of automatic word wrap within the concatenated lines.

This technique, plus the 'standard' Archive field variations possible within a Sedit designed screen, eg the colours available for the field name/label (which does not have to be the same as the variable name), text and line colours, allows one to cram a lot of data onto one screen, yet remains easy to read.

The next task was to design a program to retrieve the data required in the files (some buying up to 720K each) without the repetitive typing in of find or search commands, given the complexity of some of the latter. The resultant program, *Hunt*, which has evolved from single to multiple file use, employs another very useful facet of Archive, INSTR. Tersely cited as a function in the summary part of the Archive section of the manual, INSTR is based on the concept of finding sub-strings within a string. More importantly it can be used inconjunction with the otherwise very specific Search command. While remaining case dependent Search thus acquires a very welcome degree of flexibility. Instead of having to remember precisely all the details of each field to be searched I can now ask the QL, via Hunt, to find the record(s) covering the letter(s) written, for example, by Lord Lansdowne to Lord Cross about Sir John Gorst's speeches on India, held in the Cross Papers in the Indian Office Library, but without necessarily specifying even all of these details for the five fields involved. Thus instead of the field entry 'Lansdowne Lord to Lord Cross', 'La', 'Lan' or 'Lansd' (or other variations) are perfectly acceptable using INSTR, and a great boon when you can't remember the correct spelling of a name or word!

Faced with the sheer number of permutations possible using Search and INSTR for 14 fields I decided to restrict the Hunt procedure to seven fields: author [v1$], date [v2$], keyword [v3$: 2 lines], title (or article) [v4$], source (text, journal, archive material) [v5$] and notes [v6$, v7$, v8$]. Single field searches were omitted as they can be done with Find. Similarly the Starter procedure has been limited to five files. Given the information available in this and the Hunt procedure it is a simple task to amend them to fit in with your file record structure and data storage devices. For simplicity each field has been assigned here the variable name v$, v1$, v2$, etc. Variable v6$, v7$ and v8$ have concatenated lines, thereby allowing the three variables to provide eight

Listing 1 - File conversion programme.

```
proc start
cls
let numb=0
input at 5,2;"Old file to be examined ? - specify drive if not flp2
";oldfil$
input at 7,2;"New file to be made ? - specify drive if not flp2
";newfil$
open oldfil$ logical "o"
print at 9,2;"Old file is now open   "
cls
convert
endproc

proc convert
rem Transfers and converts old file records to new file and record
structure.
print at 9,5;"The records are being transferred now to the new file"
open newfil$ logical "n"
use "o"
first "o"
while not eof("o")
rem Do not forgot to complete the details for "o"
let n.v1$=o.
let n.v2$=o.
let n.v3$=o.
let n.v4$=o.
let n.v5$=o.
let n.v6$=o.
let n.v7$=o.
let n.v8$=o.
let n.rn=numb+1
append "n"
next "o"
let numb=numb+1: print at 9,66;numb
endwhile
close "n"
close "o"
cls
print at 6,10;"Transfer finished"
print at 8,10;"The number of records transferred to the new file is
";"numb
endproc
```

Listing 2 - Hunt.

```
proc cycle
if not found()
cls
if count=1
let count=count+1
if fil2$=""
terminal: else : close :exchange: endif
```

```
endif
if count=2
let count=count+1
if fil3$=""
terminal: else : close :exchange: endif
endif
if count=3
let count=count+1
if fil4$=""
terminal: else : close :exchange: endif
endif
if count=4
let count=count+1
if fil5$=""
terminal: else : close :exchange: endif
endif
if count=5:terminal: endif
endif
endproc

proc exchange
cls
if count=1
look fil$ logical "main":query: endif
if count=2
look fil2$ logical "a":notes: endif
if count=3
look fil3$ logical "b":notes: endif
if count=4
look fil4$ logical "c":notes: endif
if count=5
look fil5$ logical "d":notes: endif
endproc

proc hunt
if fa$="" and st$="" and tt$="" and fn$=""
search instr(v2$,fd$) and instr(v3$,ft$)
else
if fa$="" and ft$="" and st$="" and tt$=""
search instr(v2$,fd$) and (instr(v6$,fn$) or instr(v7$,fn$) or
instr(v8$,fn$))
else
if fa$="" and ft$="" and st$="" and fn$=""
search instr(v2$,fd$) and instr(v4$+v5$,tt$)
else
if fd$="" and st$="" and tt$="" and fn$=""
search instr(v1$,fa$) and instr(v3$,ft$)
else
if ft$="" and st$="" and tt$="" and fn$=""
search instr(v1$,fa$) and instr(v2$,fd$)
else
if fa$="" and ft$="" and st$=""
search instr(v2$,fd$) and instr(v4$+v5$,tt$) and (instr(v6$,fn$) or
instr(v7$,fn$) or instr(v8$,fn$))
else
if fa$="" and st$="" and tt$=""
search instr(v2$,fd$) and instr(v3$,ft$) and (instr(v6$,fn$) or
instr(v7$,fn$) or instr(v8$,fn$))
```

lines (3+3+2) for notes. To search for a substring within the eight lines requires the form of search/instr command indicated.

The data to be retrieved via the procedure Query can also be altered easily to suit different record structures. The colour of the various procedure screens employs some of the other features of Archive omitted from the QL manual but recently documented in both Quanta and *QL World*, as well as in the 'manual' for Archrtm. Finally, since Search operates serially, the various screen messages are designed to try to restrain drumming fingers when large files are being used.

If the task of amending the Hunt procedure to your files record structure appears daunting, a file conversion program is listed. All you have to do is include as the details of "o" your existent record structure in the same way as shown for "n", eg n.v1$=o. author$. You will also need to create a new file based on the field structure of "n", and save it as an empty file. When you run the conversion program in Archive, by loading it and then by typing "start", use the empty file as the new file to be created, for only it has the record structure employed by Hunt as written here.

It is perhaps worth mentioning that if the conversion and Hunt program are saved in Archive as binary rather than Ascii files (eg, save object "Convert") there is a perceptiable speed increase in their operation. To load this type of program use the command, load object "filename".

Hunt was not designed to be universal in application, being one that has been evolved to fulfil a certain need, and no doubt professional programmers may view it as inelegant. But it does work, having been successfully field tested by some of my postgraduate students, and it does fulfil its designed aim. It is hoped that the program's aim and structure may help some who, like the author, are still trying to unravel the full potential of possibly the most powerful and useful member of the Psion suite. If it does then it will help repay, albeit in a small way, some of that incredibly generous sharing which permeates the QL world and makes computing with the QL so enjoyable.

```
else
if fa$="" and st$="" and fn$=""
search instr(v2$,fd$) and instr(v3,ft$) and instr(v4$+v5$,tt$)
else
if fa$="" and tt$="" and fn$=""
search instr(v2$,fd$) and instr(v3$,ft$) and instr(v3$,st$)
else
if fd$="" and st$="" and tt$=""
search instr(v1$,fa$) and instr(v3$,ft$) and (instr(v6$,fn$) or
instr(v7$,fn$) or instr(v8$,fn$))
else
if fd$="" and st$="" and fn$=""
search instr(v1$,fa$) and instr(v3$,ft$) and instr(v4$+v5$,tt$)
else
if fd$="" and tt$="" and fn$=""
search instr(v1$,fa$) and instr(v3$,ft$) and instr(v3$,st$)
else
if ft$="" and st$="" and tt$=""
search instr(v1$,fa$) and instr(v2$,fd$) and (instr(v6$,fn$) or
instr(v7$,fn$) or instr(v8$,fn$))
else
if ft$="" and st$="" and fn$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v4$+v5$,tt$)
else
if st$="" and tt$="" and fn$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$)
else
if fa$="" and st$=""
search instr(v2$,fd$) and instr(v3$,ft$) and instr(v4$+v5$,tt$) and
(instr(v6$,fn$) or instr(v7$,fn$) or instr(v8$,fn$))
else
if fa$="" and tt$=""
search instr(v2$,fd$) and instr(v3$,ft$) and instr(v3$,st$) and
(instr(v6$,fn$) or instr(v7$,fn$) or instr(v8$,fn$))
else
if fa$="" and fn$=""
search instr(v2$,fd$) and instr(v3$,ft$) and instr(v3$,st$) and
instr(v4$+v5$,tt$)
else
if fd$="" and st$=""
search instr(v1$,fa$) and instr(v3$,ft$) and instr(v4$+v5$,tt$) and
(instr(v6$,fn$) or instr(v7$,fn$) or instr(v8$,fn$))
else
if fd$="" and fn$=""
search instr(v1$,fa$) and instr(v3$,ft$) and instr(v3$,st$) and
instr(v4$+v5$,tt$)
else
if st$="" and fn$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
instr(v4$+v5$,tt$)
else
if st$="" and tt$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
(instr(v6$,fn$) or instr(v7$,fn$) or instr(v8$,fn$))
else
if tt$="" and fn$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
instr(v3$,st$)
```

```
else
if fa$=""
search instr(v2$,fd$) and instr(v3$,ft$) and instr(v3$,st$) and
instr(v4$+v5$,tt$) and (instr(v6$,fn$) or instr(v7$,fn$) or
instr(v8$,fn$))
else
if fd$=""
search instr(v1$,fa$) and instr(v3$,ft$) and instr(v3$,st$) and
instr(v4$+v5$,tt$) and (instr(v6$,fn$) or instr(v7$,fn$) or
instr(v8$,fn$))
else
if st$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
instr(v4$+v5$,tt$) and (instr(v6$,fn$) or instr(v7$,fn$) or
instr(v8$,fn$))
else
if tt$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
instr(v3$,st$) and (instr(v6$,fn$) or instr(v7$,fn$) or
instr(v8$,fn$))
else
if fn$=""
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
instr(v3$,st$) and instr(v4$+v5$,tt$)
else
search instr(v1$,fa$) and instr(v2$,fd$) and instr(v3$,ft$) and
instr(v3$,st$) and instr(v4$+v5$,tt$) and (instr(v6$,fn$) or
instr(v7$,fn$) or instr(v8$,fn$))
endif : endif : endif : endif : endif : endif : endif : endif :
endif : endif : endif : endif : endif : endif : endif : endif :
endif : endif : endif : endif : endif : endif : endif : endif :
endif : endif : endif : endif
endproc

proc notes
print at 7,10;"No [more]records can be found in this file."
print at 9,10;"Now looking and checking the next file's ";count();"
records"
hunt
pick
endproc

proc pick
let hn$=""
while found()
remark If you have a Sedit designed screen the following line should
be entered
remark sload "screen filename": screen
remark Then remove the line below ie display. Note that the screen
file should be on the cartridge/disc in the Archive default drive.
display
while hn$<>"q"
sprint
input at 19,59;"Is this it?(y,n,q):";hn$
if hn$="n": continue : cycle: endif
if hn$="y":terminal: endif
if hn$="q": cls : close : print at 10,9;" Search terminated. All
files closed and programme stopped.": stop : endif
endwhile : endwhile
```

```
if not found():cycle: endif
endproc

proc query
cls
print chr(2)+chr(4): print chr(1)+chr(1)
print at 1,8;" Please enter the details sought . Although entries
are case          "
print at 2,8;" dependent, ";mo$;", you don't have to include all the
word or title "
print at 3,8;" - truncated versions will suffice eg Bal(four),
Med(ical), etc.   "
print at 4,8;" If you can't remember the details prompted for below
then just    "
print at 5,8;" press the Enter key.
        "
print chr(2)+chr(6): print chr(1)+chr(1)
input at 7,8;" Enter author's name -                                ";fa$
input at 8,8;" Enter date [YearMonthDay] -                          ";fd$
input at 9,8;" Enter first keyword -                                ";ft$
input at 10,8;" Enter second keyword -                              ";st$
input at 11,8;" Enter (part)title of article/journal/book -         ";tt$
input at 12,8;" Enter word sought in notes -                        ";fn$
print chr(2)+chr(2): print chr(1)+chr(7)
input at 14,28;"Are you sure? (y/n) ";f1$
if lower(f1$)="n":query: endif
if lower(f1$)="y"
print chr(2)+chr(4): print chr(1)+chr(1) at 16,8;" The file's
";count();" records are now being examined. Please wait "
print at 17,8;" - and be patient, ";mo$;". Thank you.
       "
hunt
pick
endif
if lower(f1$)<>"n" and lower(f1$)<>"y": cls : input at 9,10;" Wrong
key pressed! Press any key to continue ";wk$: let wk$=getkey():
query: endif
endproc

proc Start
cls
print at 1,25;"Hunt Programme"
print at 2,29;"  ndd 1989"
input at 9,20;"Please enter your name -  ";mo$
starter
endif
endproc
proc starter
let count=1
cls
input at 3,5;"Enter drive and name of 1st file to be used: ";fil$
input at 5,5;"Enter drive and name of 2nd file to be used: ";fil2$
input at 7,5;"Enter drive and name of 3rd file to be used: ";fil3$
input at 9,5;"Enter drive and name of 4th file to be used: ";fil4$
input at 11,5;"Enter drive and name of 5th file to be used: ";fil5$
input at 15,10;" Are the file details above correct? (y/n): ";z$
if z$="y":exchange: endif
if z$<>"y": cls :starter: endif
endproc
```

```
proc terminal
cls
print at 0,15;"Search now ended, ";mo$;
print at 1,15;"The following files were searched: "
print at 3,15; fil$; at 3,40; fil2$
print at 4,15; fil3$; at 4,40; fil4$
print at 5,15; fil5$
print at 7,15;"using the following identifiers :";
print at 9,15; fa$; at 9,40; fd$
print at 10,15; ft$; at 10,40; st$
print at 11,15; tt$; at 11,40; fn$
print at 14,15;"Do you wish to continue searching, "
print at 15,15;"- using new files?  If so enter 'n' below"
print at 16,15;"- or do you want to stop? Use 'q' to quit."
input at 18,15;"Enter your decision (n/q) now:  ";an$
if an$="n"
cls
close
starter
endif
if an$="q"
cls
close
print at 10,9;"Search terminated. All files closed and programme
stopped."
stop
endif
if an$<>"n" and an$<>"q":terminal: endif
endproc
```

FTC

© FLEET TACTICAL COMMAND

"A New Concept"

Overview:

Fleet Tactical Command is a realistic new, sophisticated, Real Time 3D Naval Strategy game written entirely in machine code that is aimed at an older user.

It has been designed to be played between two computers via network, serial or modem links or may be used on a single computer (for practice perhaps!).

The programme will run on a basic 128k QL.

The comprehensive two user package includes an instruction manual, navigation aids, a selection of charts, Scenario Logs etc., and automatic free FT-CommClub registration for 1 year.

Over a period of time the package will become available on other popular computers, the object being that any combination of two computers may be used.

The Scenario:

Set in a 1000 x 1000 square mile expanse of ocean within which there are two anchorages initially used by yourself and the enemy, and two neutral anchorages with repair/replenishment facilities.

It is a time of international conflict. Your shipping is being repeatedly harassed within these waters. The Government has declared a Total Exclusion Zone for this area. You have received a signal from Admiralty commanding you to take any necessary measures in order to enforce the Exclusion Zone and thus taking control of all anchorages.

The time taken to enforce the Exclusion Zone will be determined by the strategic skill of the opponents, certainly taking many hours to come to a conclusion.

Responsibilities:

As the Fleet Tactical Commander you are responsible for:

The initial selection of sixteen ships; Independent control of each ship either by transferring to, or sending signals; Ship's deployment, navigation, damage control and armament control/operation etc.

Ships Available are:

Strategic Nuclear Submarines *
Anti Submarine Frigates
Guided Missile Destroyers
Cruisers
Battleships
Tankers
Replenishment Ships
Minelayers

* Submarines are able to dive and have an operational periscope.

Ship's Armament:

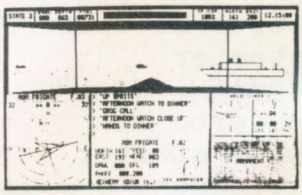
Tactical Nuclear Missiles
Sea Strike Missiles
Interceptor Missiles
4.5 inch Guns
16 inch Guns
Torpedoes
Mines
Chaff Launchers

The Bridge:

Through the bridge window can be seen ships within 25 miles in a 3D image.

Equipment on the bridge includes various digital and analogue readouts for Fuel, Depth, Ship's Compass, Multi-Range Tactical Display, Helm & Speed indicators and a sophisticated IFF Battle Computer

Bridge Instrumentation



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Command Console
Tactical Display *Armament*
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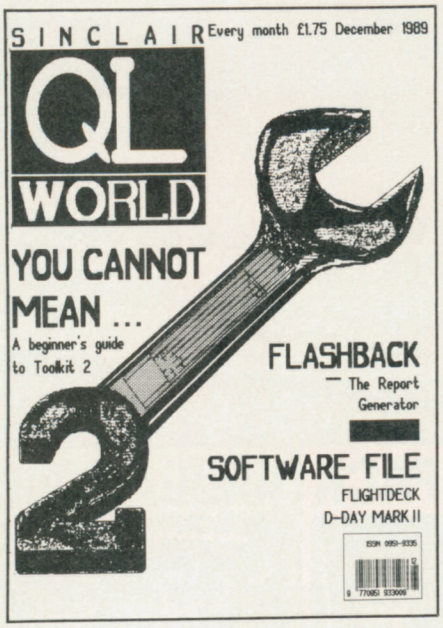
USING PROFESSIONAL PUBLISHER PART II

Bryan Davies approaches with care a versatile and complex program

This is the second part of a review which began in the 1990 issue. Some material was omitted in error. We apologise for any bewilderment this has caused, especially to the author. This part deals with a page which is all text but with some need for the ‹Mode Draw› ‹Mode Line› and ‹Mode Font› functions.



On the "cover" the picture took most of the time. The manipulation required in both the graphics and DTP programs was fiddly and time-consuming and it took several attempts to get an acceptable result. The article page, on the other hand, is mainly text, with a few graphical effects such as blocks and boxes. The bulk of the test is in a simple QL-like font, with no enhancements, and that meant that loading it onto the page was basically a matter of marking the areas to hold it, then feeding it in, piece by piece, from a word processing or editing program. The Editor was used for this job.

Side-tracking somewhat, this is an interesting example of how much flexibility there now is in QL software. The page was part of an article on basically the same subject – creating fancy text effects – and it was written on a PC, not the QL. The reason was the practical one that it was more convenient to leave the QL free for doing the work which was being written about, which was creating a sample page of mixed-size text in Quill, The Editor, Text^{87}, and Professional Publisher.

Task-switching is very useful but there is a fixed amount of memory to hold the tasks – about 830KB on my system – and you cannot get more than about three major programs, with their documents, into this space, so it was not feasible, partly from a time point of view, to do the writing and generate the material at the same time on the QL.

The two systems stand side by side and the screen of the QL can be watched while typing into the PC. In fact, the article had been started in text^{87}, then transferred to *WordPerfect* on the PC by means of the QDOS-to-MSDOS conversion utility *DISCover;* to add to the number of stages in the overall operation, this one page was then transferred back to The Editor by using another conversion utility, *XOver*. Including Artlce, that brought the total number of programs used in the preparation of the two articles to eight.

If I gave the impression that making up the article page was a five-minute job, let me correct that impression. Even putting text on the page takes plenty of practice before it can be done fluently. The first step was to put the main heading on the page, using <Mode Font>. The jagged edges of characters were smoothed using <Mode Line> and adding Arcs and Lines to the Jagged portions. Initially, the intention was to insert the Figure box at bottom left next, as this looked to be the area which was least flexible, the terms of the space required to get in all the text.

The text was already available in various files but not in a form which would allow the character styles to be shown automatically on the page. A screen dump would have been ideal, as the styles would have been there and the overall size could have been adjusted when the image was loaded into PP.

Unfortunately, the available screen dumps of the files would look nothing like the printout shown in the box – see the article in the December issue for the discussion of this point. The only program to give a WYSIWYG screen display is *Text^{87}* and the limitation of screen size would mean making several screen dumps to get the complete contents of the box. The screen is 25 lines deep, at best.

Taking the line of least resistance, the sequence adopted was to insert the heading line in <Mode Front> first, then use the <Page/Global/Columns> option to set up the page with three columns and reduce the number of <Column Breaks> to one, half-way down the page. The text file was loaded into The Editor and modified in various ways to suit the magazine layout; blank lines between paragraphs were removed and paragraph headings are altered.

The print codes I use normally in The Editor has to be changed in one respect to suit PP; the code CTRL+0–bar (the CTRL key held down whil 0 is pressed) is my code for switching off all previously-set functions, but this had to be changed to CTRL+D, which is the PP code for switching on Draft Mode. This has the same result: switching off existing functions and reverting to standard style.

The <Load Text> option was then used, with four windows being set up for the area into which the file text would go. Space was left on the page for the two blocks of larger text, with bars down the left side. To get the text to appear on the page in the desired manner it was necessary to set the <Configuration> option to WORD WRAP, <Linefeeds> to INCLUDED, <Highlights> to INCLUDED, and <Justification> to JUSTIFY – i.e., justify right and left. <Hyphenation> had been set off.

The text loaded into the boxes as desired, apart from two oddities. The fifty lines in the first paragraph was a blank – but no text was missing. For some non-obvious reason the last line above the space left for the larger text in the third column did not include the last word of the sentence, although there was plenty of room for it. The second point was of no great importance but the first obviously needed sorting out.

Reformatting the text in The Editor did not fix it. As the intention was to change the paragraph heading to a larger style it was possible to cheat and use the <Load Picture/From a Page> option to mark the text above the blank line and re-insert it one line down. This is more accurate than saving the text to be moved, as a partial page, then reloading it.

You can try the picture in a new position and, if it is not located correctly, pressing ESC will allow you to make fine adjust-

ments to the cursor position and try again. Any surplus text left above the new position can be deleted by going to <Mode Font> and using the normal QL delete keys; make sure the character size set is small, first, to avoid deleting text you want to keep.

The two paragraph headings were then added, using <Mode Front>. The next step was to add the "Part one" subheading. When putting text into a box it appears necessary to create the box first. This causes some difficulty with alignment, as the cursor in <Mode Front> is some distance above the tops of characters and it is not easy to position the cursor relative to the box in such a way as to ensure the tops and bottoms of characters will be equal distant from the top and bottom of the box.

A box stretching all the way across the page has to be created in several operations. To avoid vertical black lines appearing at intervals across the box it was necessary to use the same Ink colour as the Paper colour for the box, then add the box outlined with the Line function, also in several operations. It was found that the uniform grey-ish Ink colour which looks suitable on-screen was almost as dark as the text when printed and it had to be changed to one of the chequered ones.

To reduce the chances of the inserted text being out of line with the box it was first placed in the blank area below the middle of the box, so that the necessary spacing of the cursor above the top of the box could be ascertained and the horizontal positioning of the text checked. Even so, the page had to be reloaded once, because the vertical alignment was slightly incorrect the first time.

The spacing between characters can be undesirably large and, in the present example, the "a" was moved much closed to the "P", the "t" a little closer to the "r", and the "one" much closer to the "Part"; this all has to be checked before final insertion into a box. Inter-character spacing was reduced in several places through the page and inter–word spacing was reduced virtually everywhere <Mode Font> was used. The spacing can be altered by going into the <Command> mode when using <Mode Front> but even 0 Spacing will not necessarily cause characters and words to be aligned to give the best appearance.

The two blocks with the vertical bars up the sides took more effort than anticipated, mainly because the sizes had not been judged correctly when fixing the windows for the main text. This was pure operator error. It will be seen that the spacing on the lines in the second block is much wider than in the first, to cover for some of the error; the front used is smaller than was intended, because there was insufficient room in the first block to type the number of lines required when using the larger font. The first block looks too crowded and to close to adjacent blocks.

The box at bottom left could have been filled with text from existing files but it seemed easier to handle the various text styles by typing the text in <Mode Font>. This mode has the advantage of allowing relatively fast deletion and lateration, as well as the maximum flexibility of size and style. While, at first sight, it had looked to be the more time-consuming part of the page, it proved to be a fairly short job.

A point to bear in mind when using Italics in Mode Font is that the jaggedness of the characters varies with their inclination. This can be seen from the sample displayed when setting the inclination; "Slanting 7" looks neater than other moderate slopes – in the font used – and 13 or 16 are even better, if such a high degree of inclination is acceptable.

Saving Time

With the prospect of using graphics and word processing programs alongside PP on a regular basis, some attempt at integrating them is worthwhile. PP can be multi-tasked with other programs and has a menu option to allow the user to "step out" temporarily for that purpose. ArtIce, The Editor and text87 are all EXECable programs which can be multi-tasked.

FANCY STUFF

Which program?

Bryan Davies looks at the potential for mixing fonts and doing typographical tricks on Quill, The Editor and Text87

Purpose

'Do not abandon your old faithful without giving it a full investigation.'

Figure 1: text prepared with Quill.

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There is no problem running Text87 alongside PP, because it has no need of extension files and can be started whenever required.

ArtIce and The Editor both need extension files and the need to be loaded at the start. They can be included by lines added to the basic PP boot. I took the ArtIce boot and merged it into the PP boot, omitting only the last line, which EXECs the ArtIce programe file; in the light of previous experience mixing other extensions files with the Turbo file, as used for PP, the Artice lines were put after all the RESPR lines for PP, immdiately before the last line, which EXECs the PP program file.

The Editor is content to use the PP extensions file, so there is no point loading its Xtra file as well. There will not be enough room on one disc for all three programs unless some of the PP files are weeded out first; undoubtedly, you will not make regular use of some of the front files. The other big time-saver is to install *Lightning*, which gives PP a generally livelier feel. Again, because of previous experiences, the Lightning RESPR line was put at the start of the boot.

Tailpiece

Professional Publisher takes a good deal of learning and it is not a program which allows itself to be rushed. You really have to devote yourself to it for hours at a time and take a relaxed attitude to page production but it has no competition. Only the individual user can judge whether or not the quality of the output justified the effort put into achieving it. No attempt was made to investigate the multitude of fonts supplied on the PP disc; obviously, a serious regular user would be wise to check them and list and obtain samples of the most suitable ones.

As one who spends most of every day doing something with computers. I must admit the gradual appearance of these recognisable pages was, to my surprise pleasing but I do not doubt that whoever did the cover of the December issue took much less time for a much better result than I did. The average user wants to produce newsletters, church magazines and so on; without spanners, they could be done much faster.

The examples shown are taken from the standard printout of Professional Publisher, using four passes of the printhead on a 9-pin DMP and the interpolation option – the latter made no obvious difference. If your printer has an adjustment for head position it might be worth experimenting, but only in small increments as there may be damage to the head if it is brought too close to the paper.

On my DMP, the best position for the head seems to vary with different ribbons and with the amount they have been used; the "1" setting – closest to the paper – sometimes gives better results than the recommended "2". The "standard" option was used for page size but, in some respect, the smaller print from the "condensed" options give sharper characters and may be better for newsletters.

If this is to be done and the newsletter paper is of a fixed size you will need to work back from the size and calculate the necessary <Page Dimensions> settings before you start composing the page proper. Put some text at the corners of the page and see how they print-out with the condensed settings. You can improve appearance by photocopying the printout and perhaps reducing the size at the same time. This tends to smooth the jagged appearance of characters, and may improve the contrast, too. A check made using the version of *graFix* supplied with PP showed no improvement and gave an inaccurate length of print down the page but a new version of graFix should be available before too long and that may give better results.

ABACUS SP

James Greenhill points his Abacus in the right direction of his motoring expenses

The spreadsheet in this article was produced in Abacus to enable me to keep track of my car expenses during the financial year. Expenses are separated into various categories and costs are entered on a monthly basis. The spreadsheet can easily be enlarged to include more entries. The categories of expenses I have used include petrol, servicing, repairs, road tax and insurance.

The main calculation is that which takes the total mileage and using that with personal mileage works out the total cost of car expenses for business; this is found in CELL N28. A small table to enter mileage on a monthly basis and calculate the expenses due for the month is included in the spreadsheet, B4:G17.

Taxable

In view of present tax legislation, if you have a company car the relevant taxable sum has to be entered into the calculation. Since I own my car I am not sure where on the credit side the proportion of the value of a company car should be entered. If the sum is fixed regardless of business mileage it can be entered in J24; otherwise it has to be entered elsewhere to take account of mileage. You may also wish to enter the depreciation into the DEBIT side, J26. This would be a fixed value for the year, so that J26 would read:

(sum(I21:V21))+D, where D = Depreciation.

The spreadsheet is created as follows, first switch on auto-calc input to OFF, and Blank if ZERO to YES:

```
F3 D A [auto calc on input OFF]
B [blank if zero YES]
<enter>

CELL A1 "! <enter>
```

From now, rather than type-in ‹enter› after every line it is assumed that this is how each line ends:

```
CELL A2 F3 E A1 over range
  A2:A29
```

You can either put in the relevant year for the car expenses or omit it:

```
CELL F1  "CAR EXPENSES [year]
CELL F2  rept("#",len(F1))
CELL B4  "Vehicle Mileage
CELL       B6  col=month(row()-2)
  FROM 6 TO 17
CELL C5  "Start
CELL D5  "End
CELL E5  "Personal
CELL F5  "Business
CELL G5  "Value
CELL I4  "PETROL
CELL K4  "SERVICE
CELL M4  "SPARES
CELL O4  "REPAIRS
CELL Q4  "INSURANCE
CELL S4  "ROAD TAX
CELL U4  "SUNDRIES
CELL     I5  row=rept("-",width()+1)
  FROM I TO V
CELL I20  F3 E I5 over range I20:V20
CELL  I22  row=rept("=",width()+1)
  FROM I TO V
```

Entering this data sets out the main table to hold the figures on mileage and the sums for the various categories of expenses on a monthly basis. Once this has been entered the two tables thus far are completed by entering the following functions:

```
CELL F6  D6-(C6+E6)
CELL F7  F3 E F6 over range F7:F17
```

In CELL G6 you have to enter the rate at which your mileage allowance is paid. In my case it is £90 per month, plus 11.5 pence per mile. Therefore I enter the following into Cell G6:

```
CELL G6  (F6*.115)+90
```

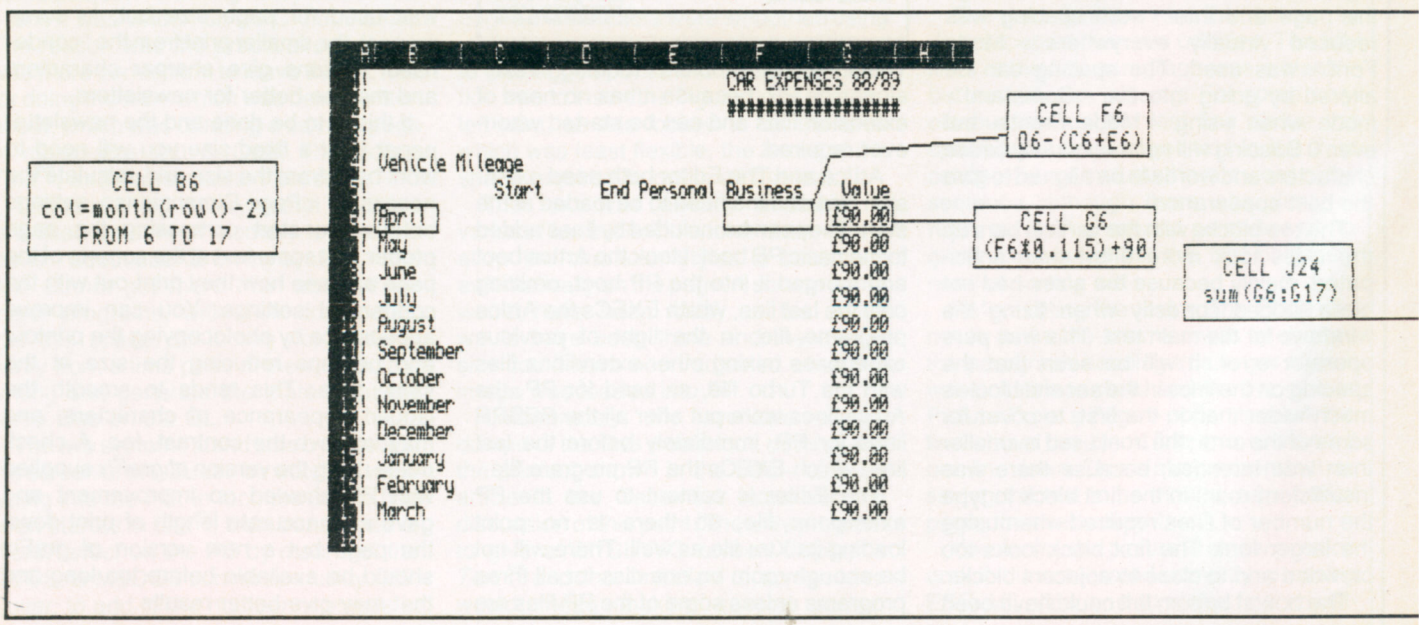
This is then echoed down the Value column to F17:

```
CELL G7 F3 E G6 over range
  G7:G17
```

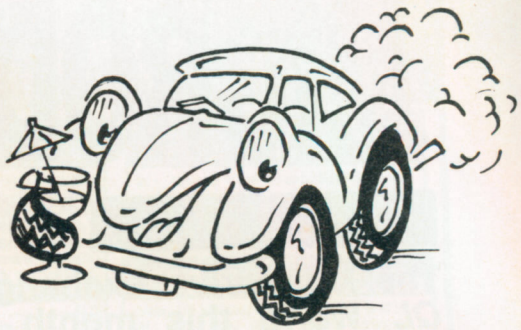
The columns in the expenses table need to be added and so you enter the following:

```
CELL J21  sum(J6:J19)
CELL  L21 F3  J21  over  range
  M21:V21
```

To enable values to be entered and



READSHEET



appear on-screen as Sterling values ["£"] you can put "– – –" into cells and then designate the cells as monetary, justified right, and so on, so that the table is tidy when data is entered. If, however, you are not bothered about the overall look of the table you do not have to enter "– – –" into the expenses table.

Cost

The final part of the spreadsheet is the calculations involved in finding the total cost of business use of the car. This involves cells I24 to N29, as follows:

CELL I24 "CREDIT
CELL I26 "DEBIT
CELL I28 "BALANCE
CELL L24 "MILEAGE
CELL L26 "PERSONAL
CELL L28 "BUSINESS COSTS
CELL J24 sum(G6:G17)
CELL J26 sum(I21:V21)
CELL J28 (J24-J26)
CELL N26 sum(E6:E17)

Before entering the formula into N28 there must be a value in N24 – any value will do – remembering to enter the formula into N24 after entering N28. If there is no value in N24, since N24 is the bottom line of a division an error message will be generated by Abacus and the formula will not enter. This is despite what was said in an article on Abacus in the June, 1986 edition of *QL World* and I have tried to enter ZERO on the bottom line of a division using both Abacus vers. 2.30 and 2.35. When N28 is entered, if the value of N24 is zero N28 will indicate this fact by showing:

<## ZERO>

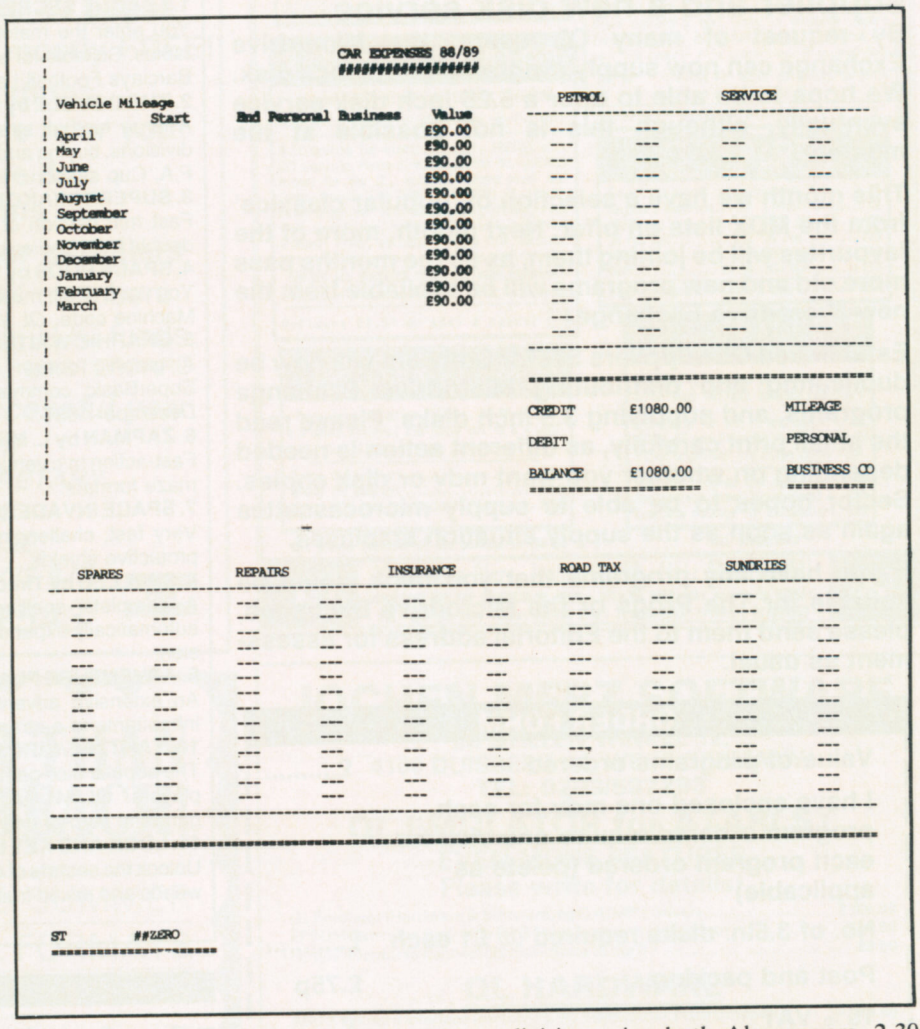
CELL N24

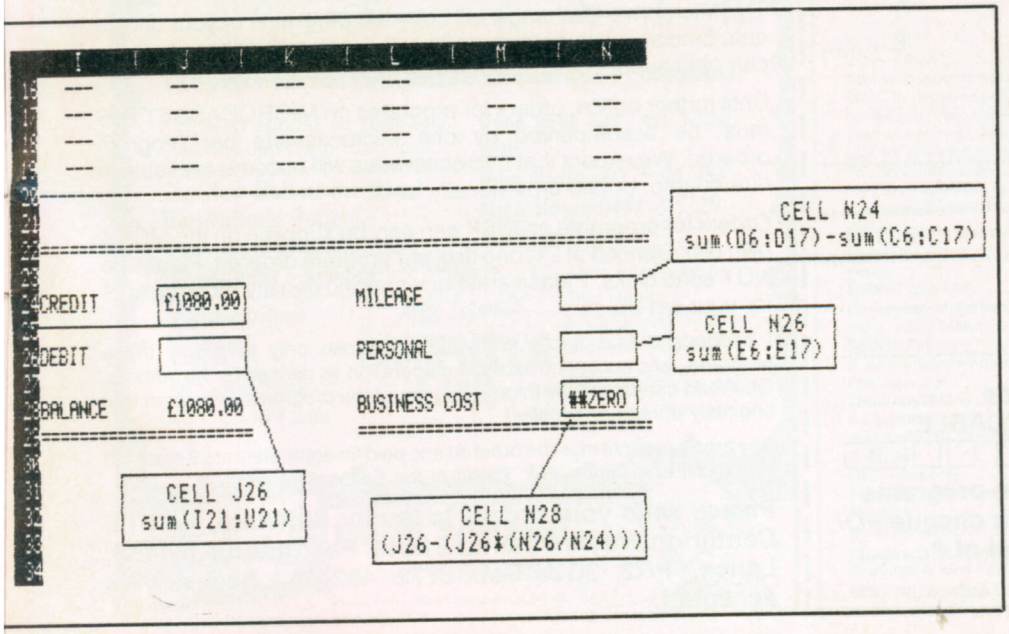
Any value will do, as explained above.

CELL N28 (J26–(J26*(N26/N24)))
CELL N24 sum(D6:D17)–sum(C6:C17)

At the end of each time the spreadsheet is used execute [F3 X] the spreadsheet twice before saving it, so that it is up-to-date.

I have found that this spreadsheet has been invaluable in helping me keep track of my car expenses for my job during the last three years in which I have used it.





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The Microdrive Exchange returns to *QL World* this month with a new supplier and a new disk service.

By request of many QL users, the Microdrive Exchange can now supply programs on 3.5 inch disk. We hope to be able to offer a 5.25 inch disk service eventually, although this is not possible at the moment.

This month we have a selection of 'popular classics' from the MDX lists on offer. Next month, more of the favourites will be joining them, as as the months pass more old and new programs will be available from the new Microdrive Exchange.

Established QL suppliers Sector Software will now be duplicating and distributing Microdrive Exchange programs, and supplying 3.5 inch disks. Please read the small print carefully, as different action is needed depending on whether you want mdv or disk copies. Sector hopes to be able to supply microcassettes again as soon as the supply situation stabilises.

If you have any programs that you think would be suitable for The Progs or the Microdrive Exchange, please send them to the Editorial address for assessment as usual.

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