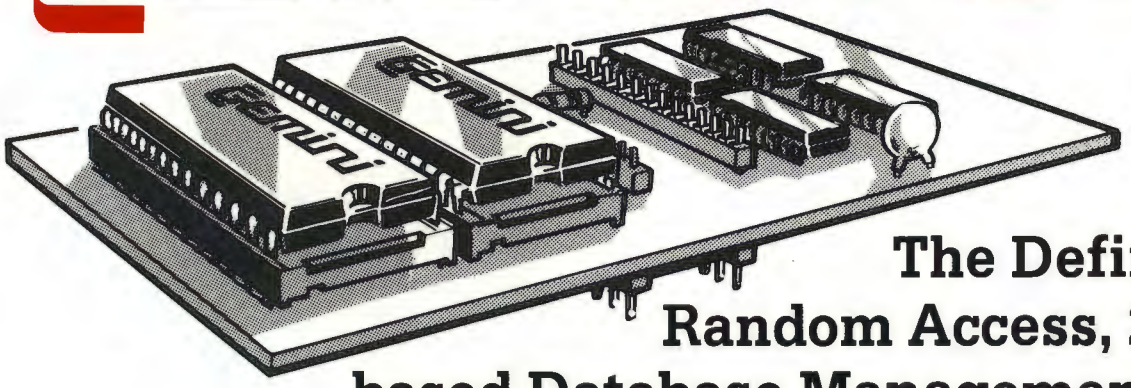
Gemini DATAGEM



The Definitive Random Access, 24K ROM based Database Management System for the BBC Micro.

INFORMATION SHEET ISSUE 2: 1st November 1984

AN INTRODUCTION TO DATAGEM

The BBC Micro has certainly made its mark as being one of the finest and most versatile machines on today's market. With so many individuals and organisations now exploiting the advanced features that it offers, including many government departments, schools, hospitals and businesses, Gemini have sought to provide a powerful Database Management System which does not compromise its capabilities by allowing use with cassette tape. The DataGem ROM system, having taken over three man years to complete, takes full advantage of the mass storage capabilities of floppy disks and will not work with tape systems.

Example Applications

Record/Cassette Collections	Personnel Records
Library Index	Software Catalogues
Geneology	Stamp Collections
Video Library	Photo/Slide Records
Home Budgeting	Household Inventory
Pupil Records	Exam Results
School Curriculae	Stock Records
Computer Education	School Reports
Mailing Lists	Personalised Letters
Product Costings	Cash Book Analyses
Sales Order Entry	Price Lists
Insurance Broking	Customer Records
Medical Records	Maintenance Schedules
Investment Portfolios	Plant Registers

The list of possible applications is endless! A database program of this type has an unlimited number of applications and may be configured time and time again to suit a particular need. Gone are the days when you have to purchase separate software for common filing applications like stock recording and mailist etc., and with DataGem you will only have to learn the one package to suit all your database needs.

DataGem is the first truly flexible mass storage database for the BBC Micro, and can make your system really useful and efficient, saving you money in the long term.

The System Comprises:

1. Two EPROMS mounted on a carrier board containing 24K of optimised 6502 machine code. The carrier board may be inserted simply in either of two positions under the keyboard, or in any sideways ROM board, e.g. ATPL 'Sidewise' or Watford etc.

2. Demonstration applications disk in both 40 and 80 track format, with useful examples of DataGem files.

3. Full colour packaging consisting of A5 ring binder with 180 page manual, user registration card and quick reference guide.

4. Utility program named 'TRANS' which will allow transference of data from other Gemini databases.

System Requirements:

BBC Micro 32K
Operating System 1.2 or later
DFS with at least one disk drive

Notes on Compatibility

Throughout DataGem, ALL file handling is offered to the operating system using the legal Acorn protocol. As such, any filing system (Disk, Double-Density, Winchester, RAM disk etc.) which implement these standard calls and support random access files will be completely compatible with DataGem.

Technical Details

A FILE may be up to 10 megabytes in length, spanning up to 4 disk drives. The file length and number of disk drives are user definable.

The FILE will contain:

A DEFAULT RECORD containing any default values or formulae which are to be entered into each new record.

A REPORT RECORD enabling mathematical values such as averages and totals to be displayed.

Two independent FORMATS allowing customisation of the second format of the record for review or printing, and quick return to normal format. Even the normal format may be altered while the file is in use. If more than two formats are required they may be saved to disk at any time for later retrieval.

The SEARCH LEVELS allow nine independent subsets known as 'search levels'. Level zero will contain the entire database, whilst other levels may contain the results of any searches, which are automatically maintained on disk, and accessible at any time. Searches may be made on subsets or the main database, and may be of the following types:

1. SEARCH the current level for any record matching a description that may incorporate ANY combination of criteria. With DataGem, but unlike other 'competitive' products, searches may be effected to ANY DEPTH of characters on ANY field or combinations of fields. Single and multi-character wild cards may be used. E.g., (where '#' = wildcard):

Search level 6 for f3="#st#on#".

This expression will find, for example, the following people from a DataGem mailist file:

Jonathan Stevenson
J.B. STEVENSON
Robert H. Stallion

2. INCLUDE within the current level, all records conforming to the search requirement from within the whole database. E.g. INCLUDE from main database F7<'23/2/74', (where F7 is a field containing birthdates). This will result in adding any people born before that date to the current level.

3. EXCLUDE from the current level, all records conforming to the description. (Opposite of search).

4. COMBINE the current level with any other specified level to create a new level containing all records from both levels. (Logical OR).

5. COMMON OCCURRENCES — Find all records which are in both the current level and any other specified level. (Logical AND).

6. DIFFERENCE — Finds all records which are in the current level or the specified level, but not in both. (Logical EOR).

As an extra facility, a wildcard may be used when entering the field number, if, when searching it is not certain in which field the data is to be found. E.g. a library index, where references may be found in many differing fields.

THE SORT ORDER

Having sorted the database (or subset), the order will be stored in such a way that the database will contain the same records, and in the same order next time you use the file. Sorting may be performed on ANY (Date, String, or Numeric) field to the FULL LENGTH of the field. Leading spaces are ignored on string fields and case discrimination may be turned off. A sort may be performed, and printout obtained, without necessarily updating the disk order.

RECORDS: Each record may contain up to 6000 bytes of DATA which does not include field titles and background text. Over 5100 records per file are allowed!

FIELDS: Maximum number of 62 fields per record, which may be any combination of the following types:-

STRING — Up to 120 characters long.

DATE — Either two or four digit year dates may be selected.

TEXT — A field with no data, allowing background text to be placed anywhere on the record. This may then be altered/moved/deleted, even after the database is in use. Up to 3000 characters of background text may be placed on the record in this way, enough for limited word processing.

NUMERIC — consisting of two parts:-

1. An entry which may be a simple value or a complex formula.

2. A result, which may be between +549,000,000 and −549,000,000 and accurate to three decimal places. The number of decimal places, and length of the display area are user definable for eeach field. If the same expression is required on all records, the field may be set to 'AUTOMATIC ENTRY MODE', reducing typing errors and entry time. All numeric values are automatically RIGHT JUSTIFIED.

The DataGem EXPRESSION INTERPRETER automatically evaluates any numerical calculations in the record upon completion of add/edit/browse, instantaneously updating all the fields which are related to the modification.

The EXPRESSION INTERPRETER supports the following functions:

VALUES:

−549755813.887 to +549755813.887, to three decimal places.

MATHEMATICAL OPERATORS

+,−,★,/, multilevel parentheses (up to 50 levels), unary negation.

LOGICAL OPERATORS

>,<,>=,<=,<>,=,★ (AND), + (OR)

SYSTEM VARIABLES

Fn (Value of field n)
If field n is a date, returns a value in the form YYYYMMDD.000. If field n is a string, it returns the value of the string (equivalent to BASIC's VAL), unless a comparison with another string is being performed.

Yn — value of year in date field n
Mn — month
Dn — day
Tn — total of field n (over current subset)
R — record number (in current subset)
N — record number (in database)
L — current level/subset
O — number of records in current level

STRING and DATE ENTRY

When entering search criteria, dates are entered between single quotes, and strings between double quotes.

Examples:-

F9="Yes"
F8>'10.9.1871'

Two wildcards are implemented for either single or multi-characters, allowing a search to be conducted throughout the entire length of a field.

F9="#SMITH#" will find:-

PAUL SMITH
D.F. SMITHSON

By entering lower case 'f' for the field description (e.g. f9="#Smith#'), case discrimination is disabled, and would now also find:

S.G. Smith
henry smithson

17 user-definable formulae have also been allocated to allow single character access to complex formulae of up to 30 characters in length. This allows the numeric characteristics of the whole database to be changed, by updating just one variable. Both the formulae and resulting values are available for examination en masse, or individually from 'Browse Mode'.

Examples:

A='20.3.1984'	—	(today's date)
B=(A-F3)/10000	—	(age if field three is date of birth)
V=15★(F3>"#export#")	—	(set VAT rate to 15%, or 0% if field 3 contains the string "Export")
F9=F8★(1+V/100)	—	(set field 9 to be VAT inclusive price)
Z=Z+(Z>F9)★(F9-Z)	—	(find the highest VAT inclusive price)
A=T9/0	—	(find the average VAT inclusive price)

General Information

DataGem uses a screen layout system whereby the VDU acts as a window on the record card which may be up to 120 characters square. To see the information which is off the card, say to the right, simply press the cursor key and the screen smoothly scrolls left to reveal the data. This concept is also used when entering data, and the cursor always remains in the centre of the screen while the card scrolls — just like a typewriter. Data entry is further enhanced by a range of utilities as follows:-

Data Entry Editor

DataGem is 'browse' orientated, by which we mean all the facilities you would expect from a database are available whilst you look at the card. For example, if you have mis-spelt a word, simply move the cursor to the mistake, and on pressing ctrl-E, you will be able to edit the data, or even the title. If you wish to add a record, move a field, enter a '★' command, change the size of the card, or even the colour, these operations can be simply performed without cumbersome menus.

Line editor features:-

ctrl-U: Wipe contents and send cursor to leftmost input character
ctrl-R: Restores data that existed prior to amendment
ctrl-D: Reset data to default value
ctrl-C: Change case of alphabetic character under cursor
delete: Deletes character to left of cursor and shifts all characters under and to right of cursor one place to left
shift-delete: Insert one character at the position of the cursor
cursor left: Move left along edit line
cursor right: Move right along edit line
(cr): Enters current contents
escape: quits entry

DataGem employs a unique RAM management system unlike any other for the BBC. When DataGem is first called, it will load as many records as it can fit in RAM so that as you browse through the file, it will not need to load records at each record, — unlike other 'true random access' databases. Also provided is the means whereby you may decide the frequency of any disk accesses required by DataGem.

Other Facilities:-

FIELD TRANSFER
The ability to transfer the data from one database to another. The database may be expanded at a later date, and fields added by the use of this utility.

COMMAND LINE
At most junctures, ★FX,★KEY,★CAT etc. may be entered (particularly useful to set up key definitions of common sets of commands).

Interface to Word Processors

As would be expected from a database of this magnitude, DataGem provides the means for simple interface of data to commercial word processors which can accept ASCII files, such as the famous 'WORDWISE' and 'VIEW' ROMs. Printed records may be diverted to output files, including the facility to set up EMBEDDED COMMANDS for 'WORDWISE', and STORED COMMANDS for 'VIEW', anywhere on the card. 'VIEW' macros are especially simplified.

Further DataGem Developments

Utilities to extract information and integrate with other databases and accounting packages from Gemini and others, including:

Clares BetaBase
GCC StarBASE
Acornsoft Collectors' Catalogue
Gemini Integrated Accounting
Gemini Mailist
Wordwise Mailmerger

Ready Application Templates

Coming Soon:

Dental Patient Recall
Photography
Mailing List
Medical/Surgical
Accounting

About the Author of DataGem

B.J. Stearn was born in 1960 and was educated at Loughborough Grammar School. He obtained an O.N.D. with distinction in Engineering Technology at Loughborough Technical College in 1978. After working as an electronics and computing technician at Nottingham University, he obtained a B.Sc. in Electronics at Salford University in 1982. He has also lectured in computing studies at both Salford Technical College and the North Manchester College.

He joined Gemini in 1983 where he now heads the firmware programming division, and has since been elected a Member of the Institute of Analysts and Programmers.

Examples of DataGem's Powerful Searching Capabilities:

Example of search (Doctor)

Thought process handled successfully by the software:

Within the 402 patients previously selected from the main database, find all male patients, between the ages of 15 and 30 to the day (even though I have only entered their dates of birth), to whom I have prescribed the drug CLONAZEPAM (or was it CLONOZEPAM? — I could never spell it properly anyway) and check whether they are also currently taking aspirin in a larger dose then 20mg daily. If this is the case, and they have at any time presented with headaches, then combine them with all patients found under another previous unrelated search and write a standard, personalised letter to them asking them to telephone for an appointment. When you've done that, I want a summarised report showing just patient name and NHS number. I want to save the standard letter under the filename 'PATS1' as I may want to use it again next week.

Example of search (Librarian)

Please search through the entire database of books on 'Serious Drinking' and if in ANY field you come across the word 'senseless' then put that record in search level 8 for future manipulation. Then I would like a report summarising the books found, by title, publisher and distributor.

Example of search (Headmaster)

From the existing pupil database containing examination results, find all 5th and 6th form pupils and place their records into level 1. Find any pupil with a weighted average performance of over 75%, automatically compensating for the fact that some students are taking more subjects than others, and place their records in level 2. Include from level 1 any students who attained a higher than average mark in either English or Mathematics, and place in level 3.

Now produce a standard letter inviting parents to the end-of-term prize day.

Now print a listing of all female pupils from the main database between the ages of 11 and 13 and generate form letters advising forthcoming rubella vaccinations.

Finally, who obtained the highest average exam marks (to 3 decimal places) in the entire school and what was the average? Please prepare the information WITHOUT performing a sort.

Example Configurations

SALES LEAD RECORD CARD
****

Lead Date: 14/02/1984

Enquirer's Name:-	Address 4:-
David Smythe	Devon
Address 1:-	Salutation:-
15 The Maltings	David
Address 2:-	Service:-
Clyst St Mary	Valeting
Address 3:-	Date Answered:-
Nr Exeter	01/03/1984

DataGem Generated Form Letter from Above Records:

(Brackets denote merged data)

Dave's Service Station
14 Livingstone Road
Clerkenwell
London EC32
Tel: 01-673-4583

(David Smythe)
(15 The Maltings)
(Clyst St Mary)
(Nr Exeter)
(Devon)

(01/03/1984)

Dear (David)

Re: (Valeting)

Many thanks for your kind enquiry dated (14/02/1984.) We can assure you of our very best attention to your requirements and suggest that you telephone the garage for an up-to-the-minute quotation.

You may also like to consider other vehicle maintenance facilities offered by this garage, and to this end I have pleasure in enclosing our latest brochure. Don't forget your anti-freeze this winter!

With best wishes,
Yours sincerely
Dave's Service Station

David Andrews
Proprietor

Example Configuration

EXMOUTH SCHOOL REPORT FORM
****

PUPIL'S NAME: Johnathan N. Smith
Form: 2A
Date of Birth: 12/06/71 Age: 12 Sex (M/F) : M

TERM PERFORMANCE WITH COMMENT:

ENGLISH LANG.	Mark 67 / 100	67.0 %	Good progress
ENGLISH LIT.	Mark 47 / 120	39.2 %	Lacks interest — could do better
FRENCH	Mark 89 / 150	59.3 %	Excellent, both written and spoken
MATHEMATICS	Mark 64 / 100	64.0 %	Good, but algebra needs attention
WOODWORKING	Mark 74 / 120	61.7 %	Imaginative and inspiring
PHYSICS	Mark 26 / 500	5.2 %	Very poor — seems uninterested
CHEMISTRY	Mark 55 / 500	11.0 %	Slow, steady progress
COMPUTING	Mark 78 / 100	78.0 %	Very good
Unapplied	Mark /100	0.0 %	
Unapplied	Mark /100	0.0 %	

Form Master: A. Thompson
Comments: Good steady results. Attentive pupil generally

Headmaster's Comments: Satisfactory

Average Mark: 48.2%
Performance: 74.7%

Roll Number: AS457 Number in Class: 19
Position in Class: 1

DataGem Generated Summary of School Report Data from Previous Example:

Johnathan N. Smith 2A 12/06/71 Age: 12 Sex: M

ENGLISH LANG.	67.0 %	ENGLISH LIT.	39.2 %
FRENCH	59.3 %	MATHEMATICS	64.0 %
WOODWORKING	61.7 %	PHYSICS	5.2 %
CHEMISTRY	11.0 %	COMPUTING	78.0 %
Unapplied	0.0 %	Unapplied	0.0 %

David J. Trehearn 2A 23/01/71 Age:13 Sex: M

ENGLISH LANG.	68.2 %	ENGLISH LIT.	28.3 %
FRENCH	56.0 %	MATHEMATICS	43.0 %
BIOLOGY	45.8 %	PHYSICS	4.6 %
WOODWORK	57.0 %	COMPUTING	68.0 %
Unapplied	0.0 %	Unapplied	0.0 %

Sheila K. Adamson 2A 22/05/71 Age: 12 Sex: F

ENGLISH LANG.	66.0 %	ENGLISH LIT.	26.7 %
FRENCH	41.3 %	MATHEMATICS	2.0 %
BIOLOGY	29.2 %	PHYSICS	45.0 %
WOODWORK	68.0 %	COMPUTING	55.0 %
ART	89.0 %	Unapplied	0.0 %

David L. Geoffries 2A 23/02/72 Age: 12 Sex: M

ENGLISH LANG.	56.0 %	ENGLISH LIT.	19.2 %
FRENCH	30.0 %	MATHEMATICS	76.0 %
BIOLOGY	46.7 %	PHYSICS	5.8 %
CHEMISTRY	0.4 %	COMPUTING	56.0 %
Unapplied	0.0 %	Unapplied	0.0 %

Matthew J. Rosebury 2A 07/05/71 Age: 12 Sex: M

ENGLISH LANG.	67.0 %	ENGLISH LIT.	46.7 %
FRENCH	18.0 %	MATHEMATICS	78.0 %
BIOLOGY	61.7 %	PHYSICS	42.7 %
CHEMISTRY	71.0 %	COMPUTING	76.0 %
Unapplied	0.0 %	Unapplied	0.0 %

Order Entry (Record Format)

ACME PLASTICS Ltd. — Tewkesbury

Telephone cost estimate

Customer name: Open Videos
Address: 96 The Parade
Exeter
County: DEVON
PO code: EX4 8YH

Contact: John Parkinson
Enq. Date: 25/05/84
Req. Date: 01/10/84

Binder size (A4,5,6) A5
Quantity Required 2000

Component	Description	Cost	Sub tot.
Front panel PVC	Weston 0.016" Black	2.50 /m	166.66
Back panel PVC	Weston 0.014" Black	2.45 /m	163.33
Board Stiffener	B/C Greyboard	0.76 /m	50.66
Ring Mechanism	3.0" D type (Bensons)	0.45 each	900.00
No. of pockets	2		
pocket material	Slim-slip Clear	3.25 /m	216.66

Material cost: 1497.32
Labour cost: 529.73
Carriage surcharge 8%

Total cost: 2189.22

DataGem Generated Form Letter
Order Entry (Print Format)

ACME Plastics Ltd
Unit 89
TEWKESBURY WEST Industrial Est.

For Attn. John Parkinson

Open Videos
96 The Parade
Exeter
DEVON
EX4 8YH

Dear Sir/Madam

Re. your telephone enquiry 25/05/84 the estimates are as follows:

Quantity Required	2000	Binder size (A4,5,6) A5
Material cost:	1497.32	
Labour cost:	529.73	
Carriage surcharge	8%	
Total cost:	2189.22	

One of our representatives will confirm this provisional estimate shortly.

Gemini Marketing Limited
18a Littleham Road, Exmouth, Devon EX8 2QG, England
Tel. (0395) 265165