

TEXAS INSTRUMENTS

A DataBase For The TI-99/4A

by Harold A. Sims

A DataBase for the TI-99/4A? Why not? It is already designed and available for use! The total cost of the software is affordable, some \$50 - \$150. Many TI owners already have the database in their module called "Personal Record Keeping". Still others, like myself, purchased the complementing modules, "Personal Report Generator" and "Statistics". When the computing power of all three of these are combined with the TI Peripheral Expansion System's (up to) five diskette drive capability, one has one of the finest relational database in the microcomputing industry today.

The Personal Records Keeping Module is a computer based filing system contained in a closed module that plugs into the GROM port on the TI-99/4A. No special programming experience or training is required for the user to easily create, maintain and utilize custom designed database files. The variety of applications can range from small household inventory; maintenance of records and listings for a small business. Owners of single and

dual diskette drive equipped TI units, if they are also owners of some of the custom units that are capable of providing 128K or more RAM, are privileged to have a database configuration that exceeds the capabilities of some of the layer databases.

The Personal Record Keeping database features enable the following:

- * setup and organization of customized files;
- * updating and rearranging of files;
- * the displaying of individual components, or groups of data records;
- * the analysis of relationships between items;
- * the evaluation of simple statistical data;
- * the saving of data to diskette as random access files, and with cassette tapes as sequential files;
- * the making of printed copies of a file(s), or from a file(s);
- * the transmitting of a file of data via RS232 facilities;
- * the receiving of data from a TI terminal equipped with the PRK module; and,
- * calculation of formulas defined in the setup of one's database.

When used alone, the PRK adds 27K bytes of RAM to the TI's Console ROM and RAM. The Statistics and Personal Reports Generator modules provide the same type of benefits to programmers. The Personal Reports Generator is used as an adjunct to a PRK module. Data may be freely exchanged between the two. The Personal Reports Generator enables the design and formulation of text and numeric data in format specified by the user. The output of a design is used for customized reports like that of PC-design databases. **IMPORTANT NOTE:** The PRK was designed by TI for use with its TP(Thermal Printer). This printer has a

limit of 40epl. The use of printers that receive Epson-style codes makes it possible for the module's printing capabilities to be fully exploited. The Epson and Gemini series of printers will respond to a hidden instruction on the order of:

xx OPEN (device #):(device name),
 VARIABLE ###
 ex: (for TI's Basic)
 20 OPEN #1:"PIO",
 VARIABLE 236

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'VARIABLE' sets the maximum width of printed matter on the page of printed data. To facilitate 132 columns of printed text, use the ESC code

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for BASIC [CHR\$(15)]. For amount of spaces in excess of 132, use the ESC coding [CHR\$(27);CHR\$(83);CHR\$(1)]. Experimentation with output capabilities of the modules will yield interesting insights to using the TI's Console BASIC and Extended BASIC Command Module with a variety of print-output possibilities.

The PRK, PRG, and Statistics modules make full use of the FCTN + numeric keys of the TI console to provide full omnidirectional cursor control, access to the plenteous help screens generated by the modules, and program flow information contained in the screen's data. With the PRK module, there are 12 function keys capabilities. Each time a different one of the modules is

used, the TI system must be re-booted. The flow of data into and out of the modules is well defined. Entering into, or backing out of the labyrinth of one of the modules is accomplished with ease. At the outset of each session, the system requires a precise entering of month, day, year, and information as to the use of a printer (y/n) and the "name" of the printing device. The modules are unforgiving and will not accept a null, or default entry at any of the first five screens of information. These screens are:

- 1) Month, Day, Year;
- 2) Use of Printer (Y/N)?;
- 3) Name of Device?;
- 4) Choice:
 1. Create a File?
 2. Load a File?; and,
- 5) Name of File? (9 chars. max)

The PRK system stores data as "pages" (records) of information. The "items", or categories of information used

in the design of a "page" determines the number of pages available for writing data. The use of short names, or strings enables an increase in the number of pages that are useable. TI recommends that one use only 98% of pages available for use to eliminate any problem of data transfer (loading and unloading of data). The PRK accepts characters and numeric data. The numeric data may be decimal-pointed, or written in scientific notation. The types of items, and rules governing their entry are as follows:

- * ALPHANUMERIC DATA - from 2 to 15 characters in length; data is uncalculable;
- * NUMERIC (integers) of up to 10 places; calculable data;
- * DECIMAL NOTATIONS up to 11 including the decimal point; and,
- * SCIENTIFIC NOTA-

TIONS up to 13 integers and notator (ex. 3.62478E10)

The names of items and file names may not exceed 9 characters in length when using PRK. When defining a page, or record, one should include 2 to 3 "dummy" items, for a file, once defined, cannot be changed. However, pages may be edited, added, or subtracted from a file within constraints of memory limits. Any single page, or record, may have up to 15 items in its listing. All of the 15 items may be either, or both numeric and alphanumeric.

When using the PRK one has 8 operational options. These, as shown on the MAIN INDEX screen, are:

- * SEE A FILE STRUCTURE
- * ADD PAGES TO FILE;
- * DISPLAY PAGES;
- * CHANGE PAGES;
- * ANALYZE PAGES;
- * PRINT PAGES (OR REPORT);
- * SAVE A DATA FILE; and
- * EXIT THE FILE

The first four of these options are rather routine in database usage; the fifth deserves special attention.

When the ANALYZE PAGES choice is selected from the MAIN INDEX, one is given yet another menu that lists 5 options and an exit to the main menu. These choices are:

- 1) DISPLAY PAGES;
- 2) PRINT PAGES OR REPORT;
- 3) RE-ORDER FILE;
- 4) SEE LINEAR FIT;
- 5) SEE ITEM STATISTICS; (and)
- 6) EXIT ANALYSIS

One may alphabetize files, analyze a whole file, set the linear fit (relationship of items to each other), use the subsets of the file structure, print reports concerning individual items, and establish the conditions for the analysis routines. As one proceeds into the analysis routines, a menu for choosing these conditions is displayed like:

- 1) ANALYZE PAGES PASSING ALL CONDITIONS; and
- 2) ANALYZE PAGES PASSING ANY CONDITION.

This ability to do analytical work in the database makes it an attractive piece of software.

The PRK module can perform eighteen types of mathematical calculations in the database. These are called "transformations." They are symbolically represented as follows:

- 1) $A = B$
- 2) $A = B + C$
- 3) $A = B - C$
- 4) $A = B \times C$
- 5) $A = B / C$
- 6) $A = B^C$
- 7) $A = \text{ABS}(B)$
- 8) $A = \text{LOG}_{10}(B)$
- 9) $A = \text{LOGE}(B)$
- 10) $A = \text{EXP}(B)$
- 11) $A = \text{ATAN}(B)$
- 12) $A = \text{TAN}(B)$
- 13) $A = \text{SIN}(B)$
- 14) $A = \text{COS}(B)$
- 15) $A = \text{INT}(B)$
- 16) $A = \text{SGN}(B)$
- 17) $A = \text{PI}$
- 18) $A = \text{RND}$

Once transformations are made on data, the changes cannot be recalled; they must be redone. The sole exception to this is that data be saved to the mass storage device used, from whence it can be loaded back into the database (and only as a complete file). When one considers that the TI-99/4A is a "home computer", this is not an inherently serious shortcoming of the system. The index to the transformations sequences desired sounds like that of a well known database called dBase II. The TI-99/4A's index of instructions is on the following order:

- 1) SEE TRANSFORMATIONS
- 2) DO TRANSFORMATIONS
- 3) STORE TRANSFORMATIONS
- 4) STORE AND DO TRANSFORMATIONS

The Help screens resident in the database query the user and lead one into an easy-to-use database structure by requiring only one key stroke to select appropriate responses. An example of this, the following:

```
DISPLAY PAGES (Y/N)
IS B A CONSTANT (Y/N)
PRESS #2
PRESS ENTER, etc.
```

The PRK module will

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automatically evaluate common statistics. One may choose the method of calculation from a menu that looks like this:

- 1) ITEM =
- 2) MEAN =
- 3) STD DEV (iation) =
- 4) MAX VAL =
- 5) MIN VAL =
- 6) SUM (of data items) =
- 7) DATA (number of items) =
- 8) MISSING (items of data) =

When used as a simple statistics calculator, the PRK is limited to 15 items per record (or page). The PRK, when used with the Statistics module ups the number of items per record to 99. The Statistic module complement of this database is a powerful time-saving tool for statistical analysis that can do all of the following:

- 1) DESCRIPTIVE STATISTICS
 - a. Mean
 - b. Frequency
 - c. Standard Deviation
 - d. One Way Frequency Tables
- 2) CORRELATION DATA
- 3) LINEAR REGRESSION CALCULATIONS
- 4) INFERENCEAL STATISTICS
 - a. Tests for matched groups
 - b. Tests for Independent Groups
 - c. Analysis for Variance
- 5) VARIABLES COMPUTATIONS etc

Generator) module, which may be used in concert with the PRK and Statistics module. The Personal Reports Generator enables the precision formatting of reports of data that are housed in the database, and/or the Statistics module. The PRG allows for locating names, headings and data in places of the user's choice. The location of each

data item is precisely determined, and is shown on the monitor, and/or in print in the exact form that the user specifies. Of the three modules, the PRG is the most unforgiving of all in terms of the accuracy of data entries. It simply permits no mistakes, nor will it accept erroneous data entries at any point. Yet, while it is tedious in its requiring that one

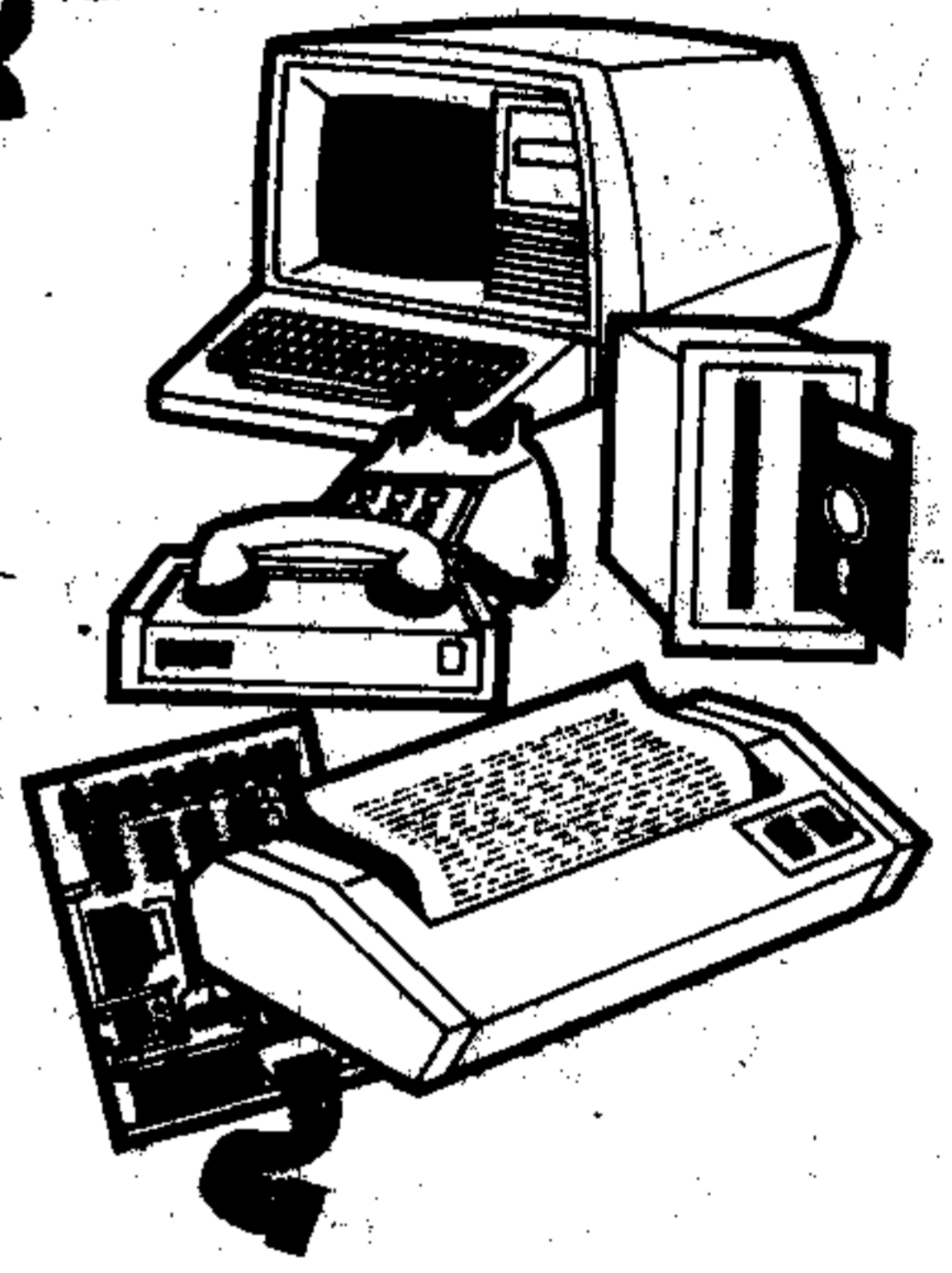
use it with precision, the end result, the finished report product is well worth the tedium involved.

The database that has just been described is of great value to those who have need of a database software package. The price is very reasonable and the utility is practical. Whether one be keeping track of a stock portfolio, maintain-

ing student's grade records, computing test scores, or using it in business. The system is an excellent choice for those who own the TI-99/4A and cannot afford a larger Personal Computer, but would like the luxury of having an adequate database. A TI-99/4A Database can be had for as little as \$150. It is worth every cent spent for its acquisition. ●

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Randy's Ravings

by Randy Holcomb

This month is another pot-pourri of things in and around the TI world. First off, lets peruse the book market.

Books, Books, Books! And

plenty of them. Within the last year most of the major book publishers have released books on or for the TI 99/4A computer (and recently while I was in Dallas I saw a book for the TI PC folks as well) covering a dearth of topics; with most of

the books being on an introductory level on what a computer is and how it works and what it takes to make your system useful. Other books have been seared towards programming your computer in BASIC/Extended BASIC or Assembly languages, and other books chock full of games.

Of the beginner book class, The TI 99/4A User's Guide by

Carol Ann Casciato and David Horsfall (Howard Sams and Co., 4300 W. 82nd, Indianapolis, IN 46268) is a good example of an introductory book giving the reader an overview of the machines capabilities without getting too technical (read: without having to explain what GPL is or how memory mapping works, etc.) Also, this book serves to assist you in defining what you want to do with your system and explains what is needed to achieve your goals. Of course, some of the material is dated in the book (such as the late-and-lamented HexBus peripherals for the /4A) but the concepts set forth in this book gets you well on the way. And the appendicies are well thoughtout with a glossary of terms used by all us /4Aers and it lists where you can obtain additional information.

Now that you've cut your teeth on BASIC and want to learn assembly language but find the TI Editor/Assembler manual foreboding and unintelligible, look to Introduction to Assembly Language for the TI Home Computer by Ralph Molesworth (Steve Davis Publishing, P.O. Box 190831,

Dallas, TX 75219). This book starts you off explaining binary notation (standard fare for most assembly books) and then goes on to explain the addressing modes, register usage, assembly coding (for both the Editor/Assembler AND Mini Memory-nice touch!), the assembly process, handling screen and keyboard I/O, then moving on to file I/O and interfacing assembly code to BASIC. There are a few printing errors with the first edition; Steve Davis has stated that a revised edition is coming out so if you are looking to get the book check to see if its the second printing. The most glaring error is with the program listing on page 25 of the book on lines 11 and 12: the listing is correct but the ensuing text description has the lines switched. With this fault aside; the book conveys the essence of how involved assembly is (each program is explained on a line-by-line basis) but reminds you of the enormous benefits that assembly language has. (For you TI PC fans, I have heard that Steve Davis Publishing

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will be releasing a book shortly for the TI PC; no release date has been announced as of this time. Watch this column!

When the Editor sent me Entertainment Games in TI BASIC and Extended BASIC by Khoa and Quyen Ton (Sams) I just sorta looked at it and said: "Oh goodie (yawn) another book of games." Boy was I WRONG! First, this book comes with a tape of ALL the programs inside the book: score 1 for Sams. Second, these programs are GOOD! The authors (both high school students) have done an excellent job of explaining how the games work, and the games themselves are quite playable and fun to watch. (Some of them look very close to TI-released games, Arrow Zap for example looks pretty darn close to ZeroZap.) For me the biggest selling point this book has to offer is the tape: I had no trouble loading any of the games off the tape and playing them. And the price (\$15.95 sugg. retail for book and tape) qualifies this to be a Bargain.

Any CC-40 owners out there? TI has released the modem peripheral for the Hex-

is bringing the total number of peripherals to 3; along with the RS232 module and the printer/plotter module. Of course as you all know by now the WaferTape storage module has been cancelled due to reliability problems; there have been rumors circulating that the CC-40 will be reintroduced with cassette storage; when it will be rereleased is up in the air. However, a lot of people have been upset that TI never delivered the WaferTape and feel that the CC-40 is useless to them; several people have written to TI and have asked for TI to take back the CC-40. It is my understanding that TI HAS indeed refunded individuals who have sent back their CC-40s. At this moment I don't have the specifics on how to send your CC-40 back if you REALLY want to; if there are enough disgruntled CC-40 owners I will round the info up. With CES in June this may unleash the floodgates for the CC-40; I hope it does as it is a nice unit (the Video Interface unit and modem combo would be well-suited for traveling and may even be lighter than a RS Model 100!)

Home Computer magazine, formerly 99er Home Computer magazine, formerly 99er magazine, has had its share of problems as of late. First wave

of problems hit when Black Friday hit; some quick reshuffling took place and the first issue of Home Computer magazine came out on the stands. However, it took a few months before the next issue came out; several people have been complaining rather vocally on the TI Forum on CompuServe about the poor performance of getting the publication in a timely manner; also several people have mentioned they sent their money in for the program disks advertised back in January and have not yet received their disks. Anybody else out there having troubles with Home Computer magazine?

CorComp has started shipping their standalone micro expansion system. And it is quite small: about the size of 3 speech synthesizers back-to-back. Initially they are being shipped as a base unit containing 2 RS232 ports and a parallel port (akin to their RS232 card for the PEBox) with connectors on the board for piggybacking 32K memory and their DS/DD disk controller. The DS/DD controller has caused quite a stir as of late; several target dates for release have slipped past and folks are wondering if they will deliver. CorComp insists they will; personally I will believe

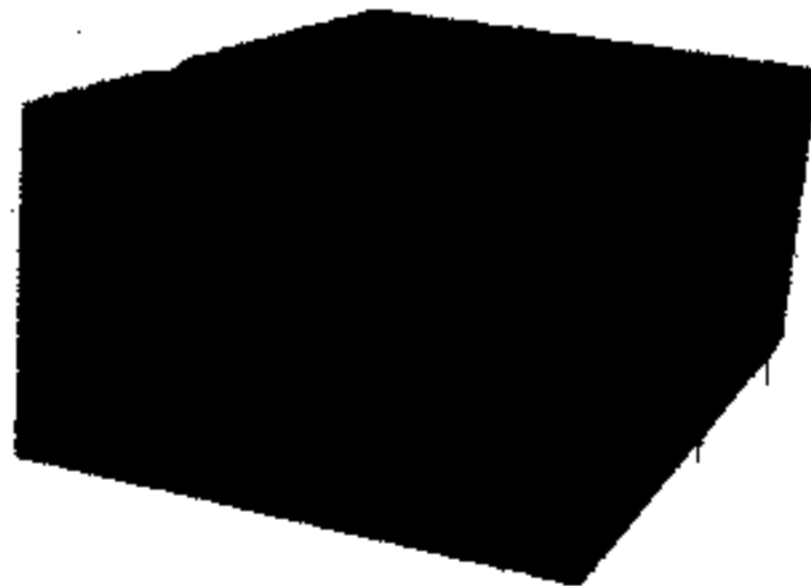
it when I see it and use it. Reverse engineering RS232 cards isn't difficult; reverse engineering a disk-based file management system is non-trivial.

Three Cheers For Infocom for coming through with all the Zorks, StarCrosses, Deadlines and all their other prose games. I have been playing StarCross with another friend who has his version running under RT-11 on a DEC 11/23 and its nice to be able to work back-and-forth like this. I did notice on the TI version that if you specify the wrong drive during a RESTORE (like drive 3 and not having one!) you can't RESTORE properly; a \$VERIFY will fix this problem; but I did run across a bug where if you type a wrong keyword with BASKET (I forget the action that you do to the basket) the program locks up. Outside of those minor glitches, these games are a refreshing alternative to the many video games for the /4A.

Thanks to Jim Peterson of Tigercub Software for providing us with a good-sized list of user's groups. Check the User's group list in this issue and see if your User's group is listed: If not, send it in! Next month: MBX Review, Disk Sector I/O, and latest TI news. ●

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DISK DRIVES

- SUPER 5 5/4" half height direct shaft drive \$235
- SUPER 5 5/4" quality half height, Apple compatible \$210
- MITAC 5 5/4" Apple style full size, Shugart based \$179

MONITORS

- GORILLA 12" green \$94 Amber
- ZENITH ZVM 123 12" green \$119
- BMC 12" color \$219

APPLE CARDS

- TACKLER Parallel w/graphics dump \$99
- BELTRON 280 card \$69
- BELTRON Apple type 2 disk control card \$50
- BELTRON 80 column card \$85
- BELTRON EPROM Writer \$75
- BELTRON 128K card \$215

PRINTERS

- C. ITOH Prowriter 8510 parallel/10" dot matrix \$390
- C. ITOH Prowriter 1550 parallel/15" dot matrix \$750
- GORILLA Banana 10 inch dot matrix/parallel \$207
- OKIDATA ML92 10" dot matrix \$449
- OKIDATA ML 82A dot matrix/parallel \$349
- C. ITOH Prowriter F-10 serial/10" dot matrix \$1250

THRIFTY BITS

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