

MICROpendium

Volume 8 Number 5

June 1991

\$2.50

PROGRAMMING IN THE DARK

page 11

The Lima Fair:

TIM

Harnessing the 99105
CPU chip

More plans for
MIDI Master 99

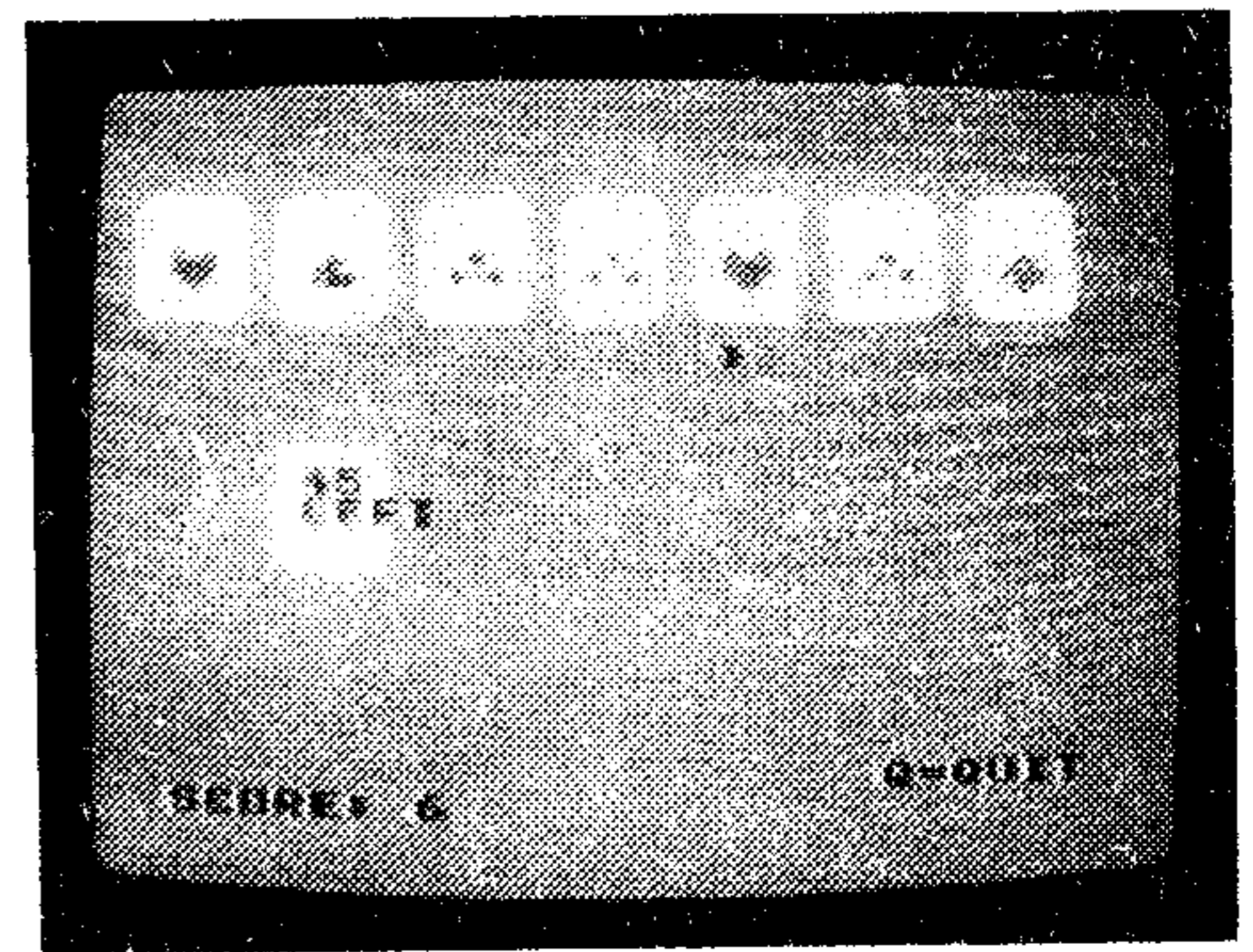
And more —
available on video

See
Page
19

And games:

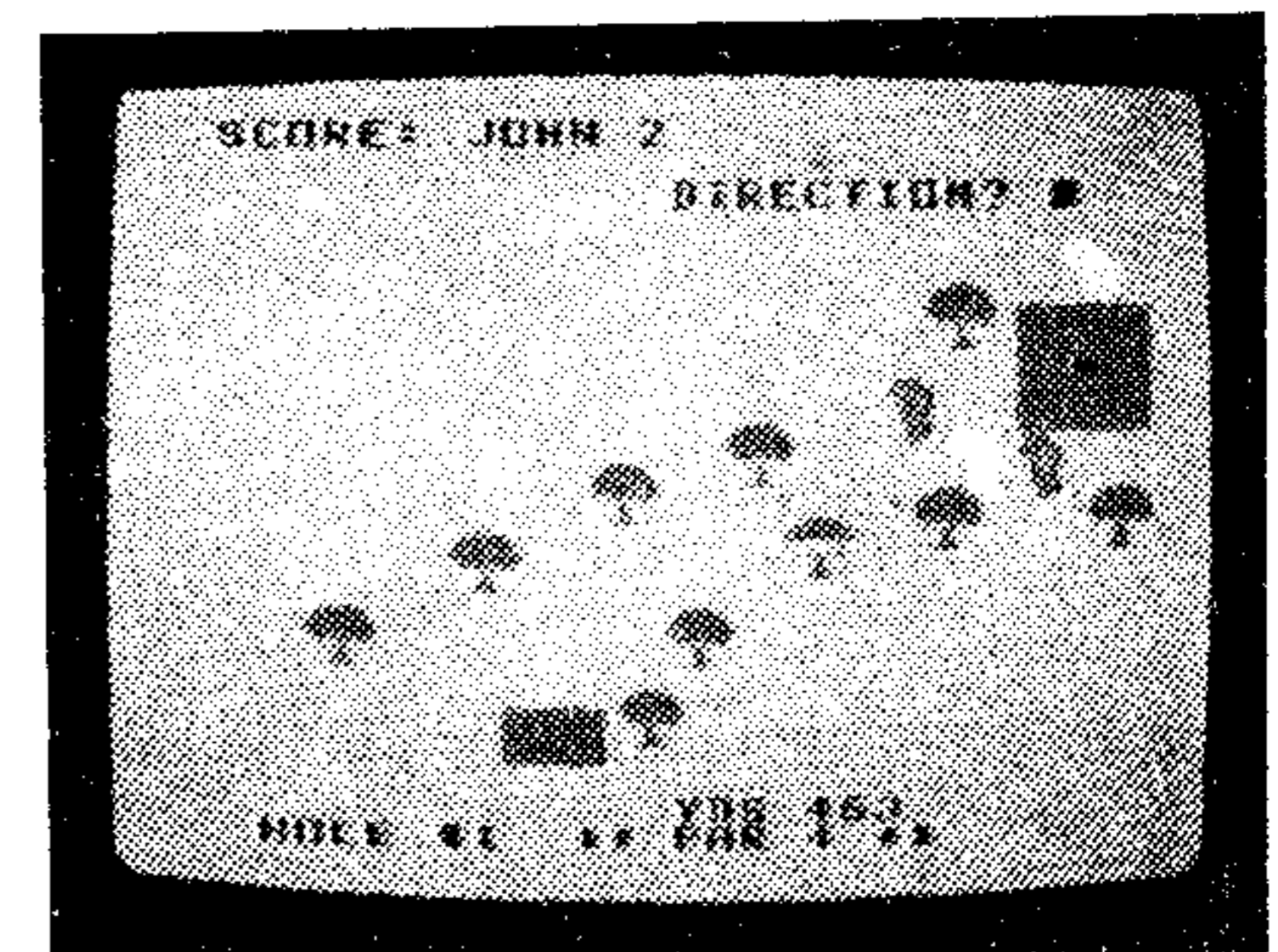
Accordion Solitaire

Page 8



Golf

Page 15



Plus our usual news, reviews, tips and other great stuff!

SPECIAL

The Oscar™ Software Library

\$12.95 Plus S&H
ALL 28 PROGRAMS ON DISK OR CASSETTE WITH PRINTED INST. SPECIFY DISK OR CASSETTE!!

A complete home and family software library for the TI-99/4A for ONLY \$12.95 (less than 50¢ per program).

In 1983, the DataBar Corporation developed an extensive TI Software library which they planned to distribute in bar code form in a monthly magazine which the subscribers could then load into their computer with the "Oscar," a compact bar code reader. Due to changes in market conditions, DataBar has discontinued its home computer division and Tex Comp has bought out their entire library of TI-99/4A Software on disk & cassette. Tex Comp now makes this extensive library of over 28 assorted programs with complete printed instructions and documentation available on cassette or disk (PLEASE SPECIFY) at only \$12.95. These professionally prepared programs include education, entertainment, personal enrichment, first aid, finance and law.

TITLES INCLUDE:

Match—Find the pairs of numbers hidden behind the computer's doors

Four-In-A-Row—Be the first to make a row of four

Pachisi—A race to the finish line

ROI—Return On Investment

Loan Amortization—How much principal and interest will you pay on a loan?

Speller—A Spelling and Typing Tutor and a game of memory

Alphabet House—Build your own house with your alphabet skills

Running Planner—How rapidly should you increase the distances you run?

Word Habits—Keep reading and writing habits up with current demands

Amulet—Search the cavernous building to find the precious Amulet

Caterpillar Climb—Solve addition problems to move your caterpillar over the wall

Financial Quiz—Check the pulse of your pocketbook

IRR—Internal Rate of Return

Math Challenge 1—Pit your mathematical skills against the computer or a friend

Star Count—Use logic skills to spring open a box of shining stars

Health Assessment—How are your current health practices affecting your life expectancy?

The Law and You—A look at how laws affect your daily activities

Speedreading—Train your eyes to take in more words per second

Code Master—Discover the secret code

Room to Move—Unscramble the letters with wise moves

NPV—Net Profit Value

Payback Period—Payback Period

Balloon Dart—Build your skills with fractions as you aim and fire your dart

States 'N Capitals—Can you name more capital cities than your opponent?

First Aid - Burns—How should you react in an emergency burn situation?

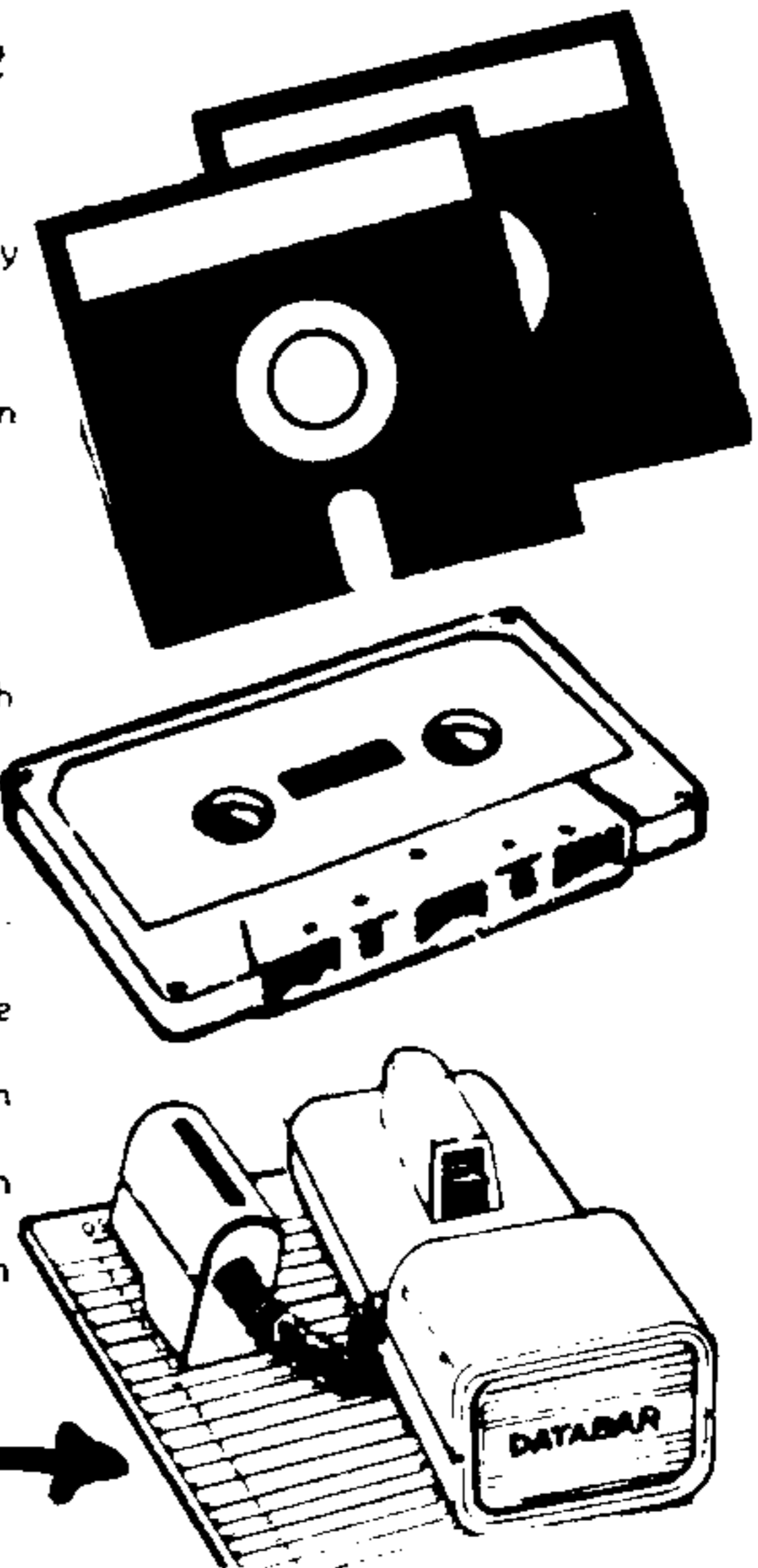
Triangle Solutions—This makes math friendly for your practical applications

Sentence Tutor—Practice breaking down sentences into their essential elements

Program in Basic—Eases the chore of learning to program

Attention Hobbyists & Gadget Lovers: Tex-Comp has a limited supply of brand new Oscar DataBar readers in factory-sealed cartons (complete with cable for the TI-99/4A) & packs of assorted bar code software. Complete package, No Warranties, **ONLY \$9.95** when purchased together with the above offer.

THE ONLY SCANNER EVER MADE FOR THE TI-99/4A



SPECIAL



NEW LOWER PRICE!!!

Bits And Bytes Of Computer Action!

For the Texas Instruments Home Computer...

50 READY-TO-RUN PROGRAMS ON CASSETTE OR DISKS



Includes 141-page "Bits & Bytes," an easy-to-read book which not only lists out and completely explains all 50 programs, but covers: Using and Understanding Commands, A dozen hints and tips, Programming and Flowcharting made easy.

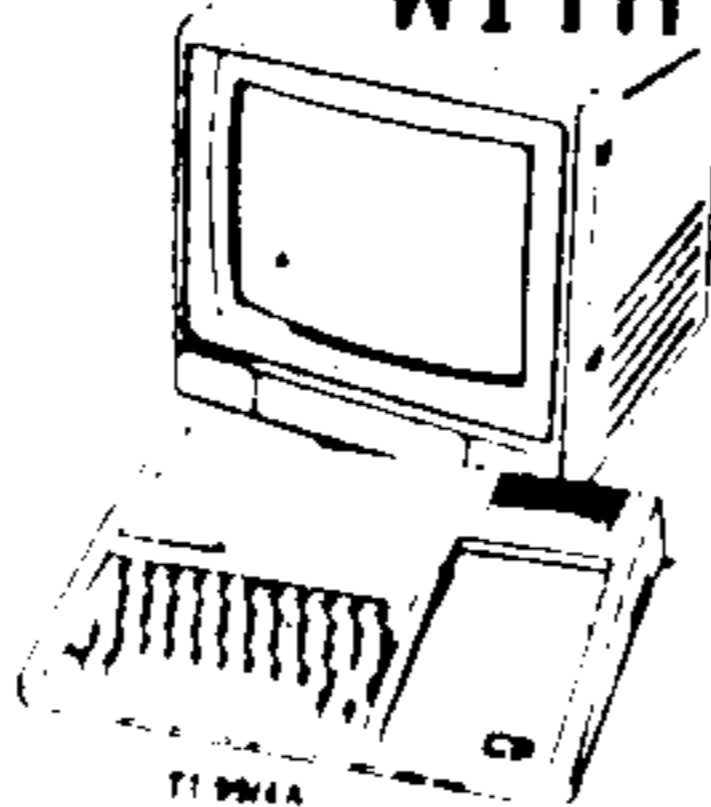
INCLUDES:

OFFERED EXCLUSIVELY BY TEX-COMP

- SECTION #1 PROGRAMMING COMMANDS MADE SIMPLE
- SECTION #2 FLOWCHARTING FOR EASY PROGRAMMING
- SECTION #3 PROGRAMMING HINTS AND TIPS
- SECTION #4 FIFTY READY TO RUN PROGRAMS ESPECIALLY FOR THE TI-99/4A

- FLAG AND NATIONAL ANTHEM (B)
- MAZE BOGGLE (XB)
- WORD SEARCH (B)
- BASEBALL QUIZ (B)
- NOVEL TI (B)
- BASIC MAGNIFY (B)
- MESSAGE BOARD (XB)
- MUSIC MAKER (B)
- BILL FILING SYSTEM (XB)
- DOODLE (B)
- FLASHCARDS (XB)
- BYTEMAN (XB)
- ARITHMETIC EXERCISE (XB)
- SPELLING EXERCISE (B-TE2)
- STATE CAPITOL QUIZ (XB)
- SPACE FURY (XB)
- DEATH MOBILE (B)
- GRIZZLEY (B)
- TONK (B)
- CURVE PLOT (B)
- CIRCLE PLOT (B)
- TOE-TAC-TIC (B)
- LOAN CALCULATING PROGRAM (XB)

ONLY \$12.95 Plus S&H
DISK OR CASSETTE
BE SURE TO SPECIFY WITH YOUR ORDER!!!



- KEYBOARD TEACHER 1 (B-TE2)
- KEYBOARD TEACHER 2 (B-TE2)
- MARTIAN PROBE (XB)
- SOUND EFFECTS CATALOG (XB)
- HOUSEHOLD INVENTORY (B)
- GEEN GAME (B)
- WORD CRAZE (B)
- WONDER MATH (B)
- HOME PLANT CARE LIBRARY (XB)
- DOXOLOGY (B)
- ARTILLERY ACE (B-TE2)
- SKI RUN (XB)
- HAPPY BIRTHDAY (B)
- VISUAL VALENTINE (B)
- BLACK JACK (B)
- TRAP (B)
- MATH CHALLENGE (B)
- STRANDED (B)
- LAS VEGAS LUCK (B)
- GRAVITY SIMULATION (XB)
- SKYDIVING CHALLENGE (XB)
- MAZE MADNESS (B)
- MAIL AND PHONE LIST (B)
- SPEECH SOUNDER (B-TE2)
- EVIEL-EYEVIL (XB)
- SPACE SHUTTLE COLUMBIA (XB)
- QUEST (XB)

GRAPHICS, SPEECH & EXTENDED BASIC

NEW LOW PRICE
Bits & Bytes (Cassette)
Bits & Bytes (Disk) ...
\$12.95

Send order and make checks payable to:

TEX+COMP

P.O. BOX 33064—GRANADA HILLS, CA 91344



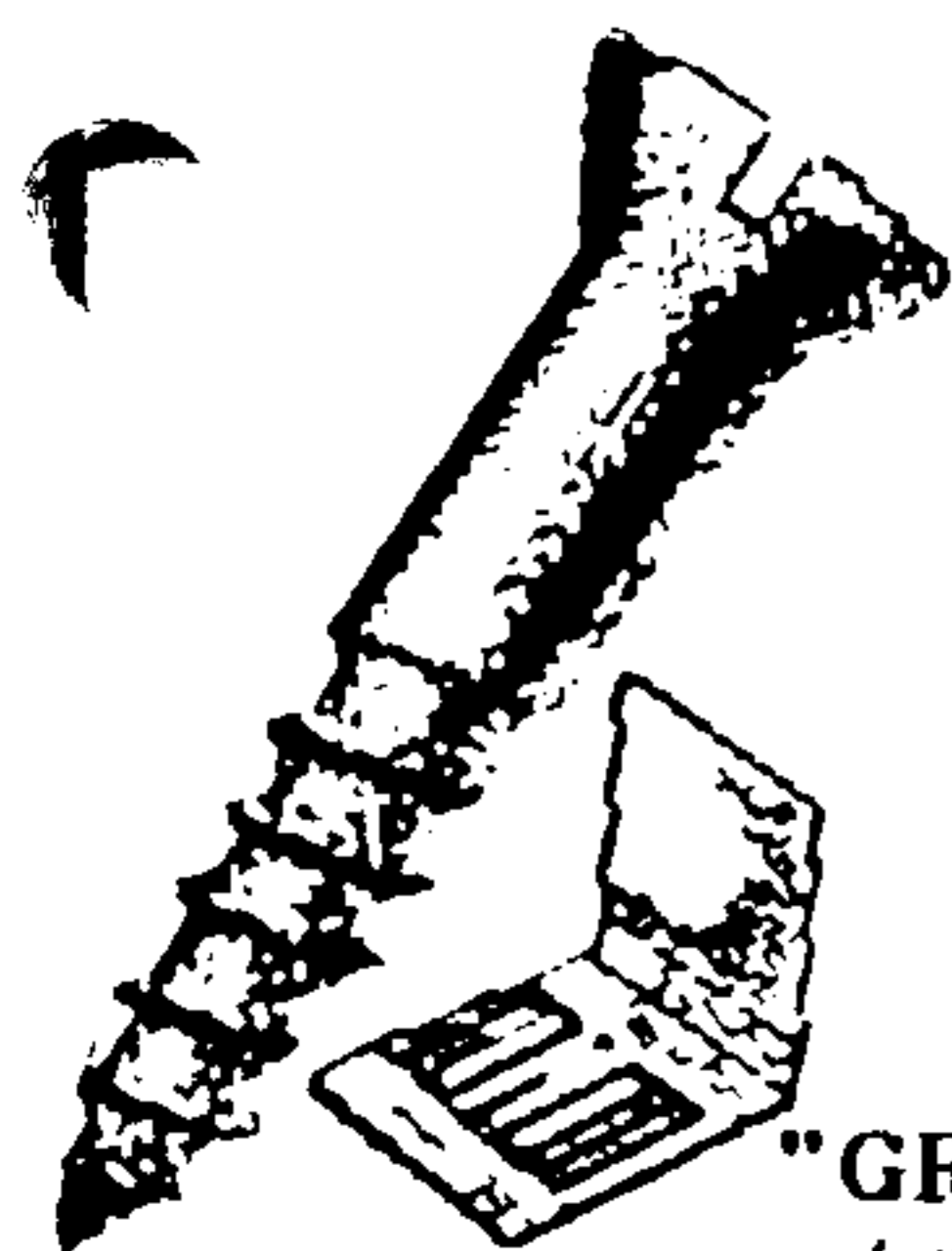
AUTHORIZED DEALER



VISA and MASTERCARD
HOLDERS CALL DIRECT
(818) 366-6631
24 Hour Order Line

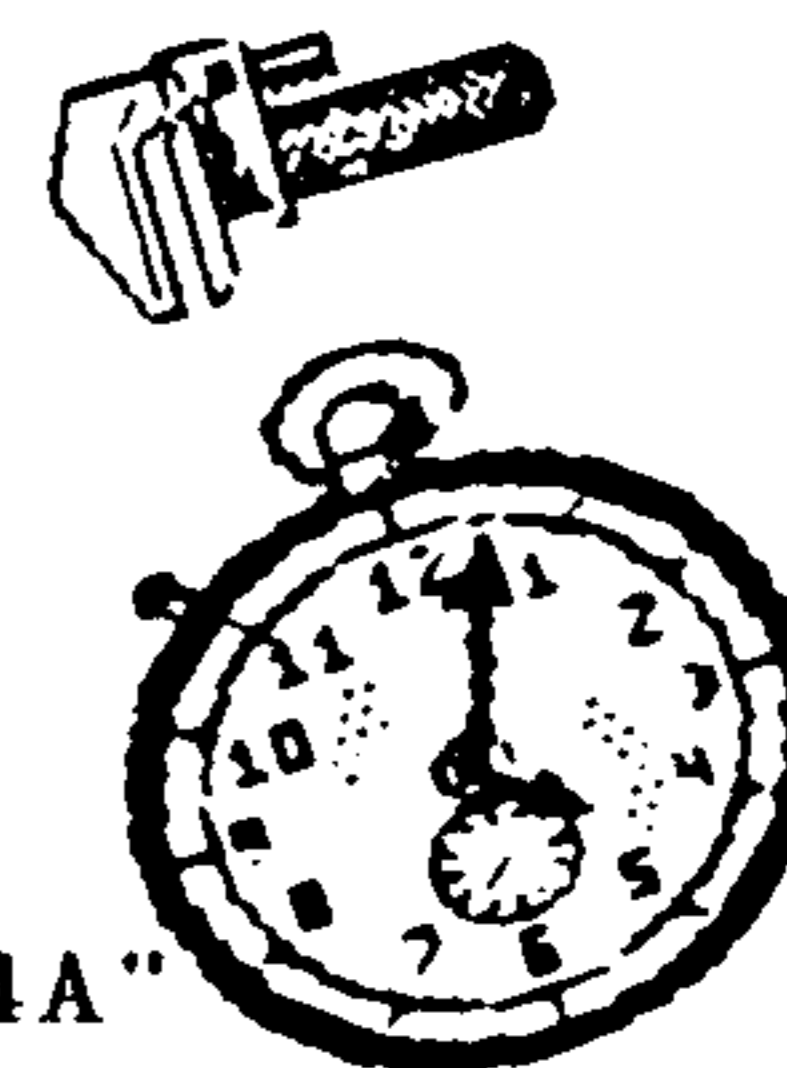
TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mississippi 4 1/2%. Add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.

NOTE: Payment in full must accompany all orders. Credit card, Company check or Money order for immediate shipment. Personal Checks require up to 4 weeks to clear. California orders add 6 1/2% sales tax.



Publish like a Pro!

Big Price Reduction for Our Full-Featured COMPLETE PRINT SHOP PACKAGE FOR THE TI-99/4A



"GRAPHX IS THE BEST DRAWING TOOL AVAILABLE FOR THE 99/4A"
(CHRIS BOBBITT OF ASGARD)

GRAPHX + with Flip & Rotate & Quick Load

THE ALL TIME BEST GRAPHICS PROGRAM FOR THE 99/4A HAS JUST GOT EVEN BETTER WITH AN ALL NEW PACKAGE AT A GREAT LOW PRICE. ONLY \$19.95 COMPLETE WITH GRAPHX+ AND TWO DISK SIDES FILLED WITH NEW CLIPART AND FONTS. GRAPHX+ OFFERS EVERY FEATURE YOU NEED TO CREATE THE BEST 4A GRAPHICS YOU HAVE EVER SEEN. GRAPHX+ OFFERS FEATURES SUCH AS FREE HAND DRAWING AND ERASING, ZOOM FOR DETAILED WORK, AUTO FILL, COLORS, TEXT AND TITLES, AUTO CIRCLE DRAWING, CLIP STORAGE AND ANIMATION. 32K, EXBASIC, AND A STAR/EPSON COMPATIBLE DOT MATRIX PRINTER IS REQUIRED.

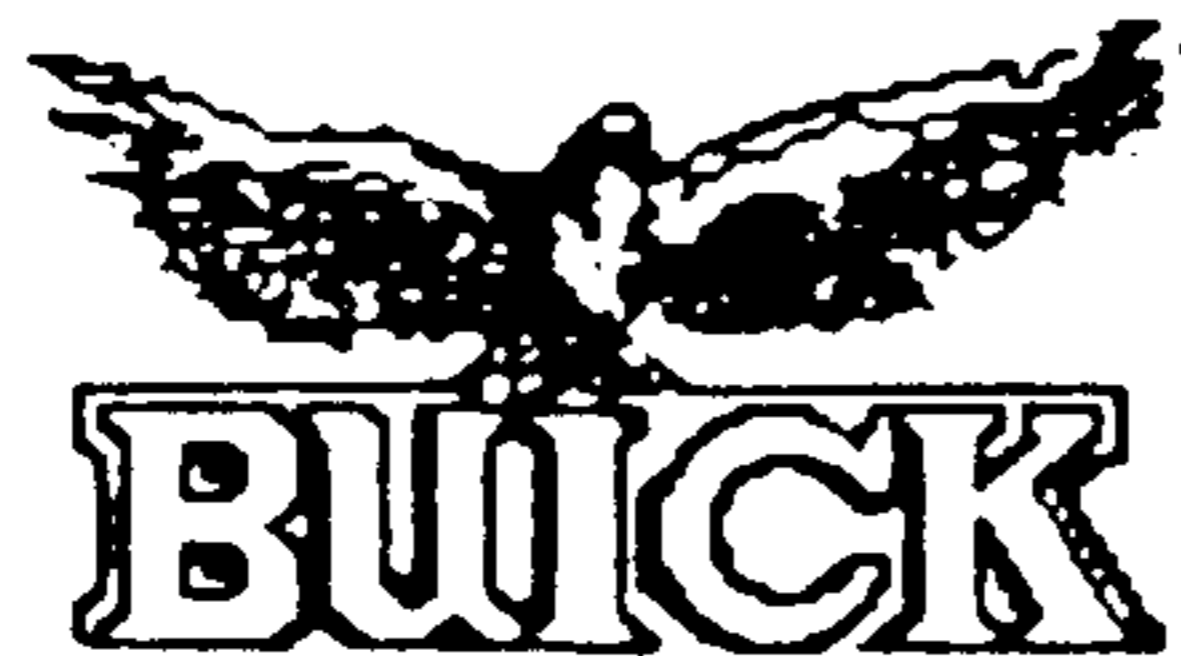
ONLY **\$19.95** **INCREDIBLE NEW FONTS**
LARGE WEIRD SLANTED
FOR ALL OCCASIONS

PACKAGE INCLUDES
GRAPHX+ & 2 DISKS
OF FONTS & CLIPART

CLIPART AND PICTURES TOO!!



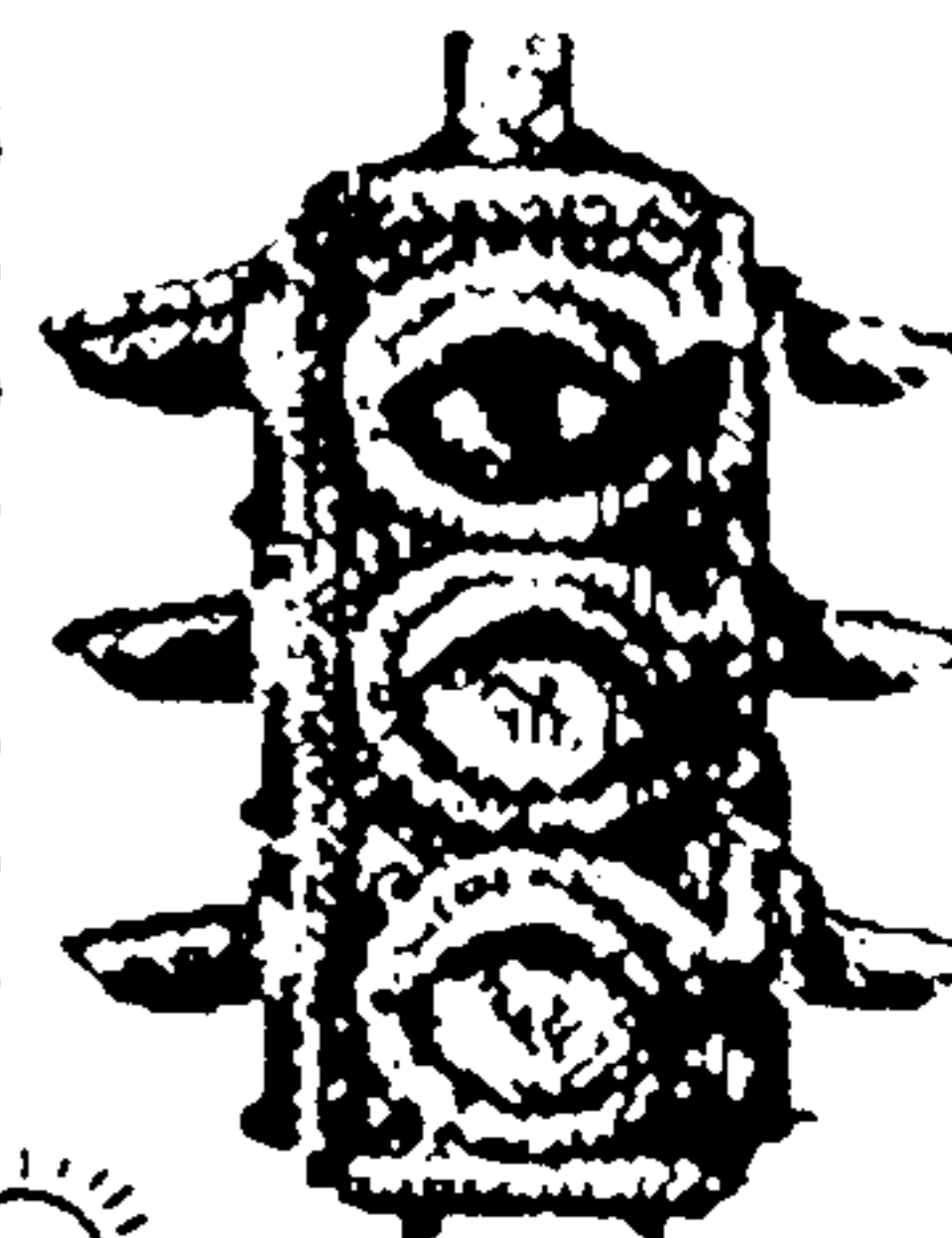
Accessories



A WIDE ASSORTMENT OF COMPANION PROGRAMS ARE AVAILABLE FOR GRAPHX

- ASGARD GRAPHX COMPANION DISK I (CLIPART & FONTS).....\$7.95
- ASGARD GRAPHX COMPANION DISK II (CLIPART & FONTS).....\$7.95
- ASGARD GRAPHX COMPANION DISK III (CLIPART & FONTS).....\$7.95
- ASGARD GRAPHX COMPANION DISK IV (CLIPART & FONTS).....\$7.95
- (SAVE \$7- ORDER ALL FOUR COMPANION DISKS FOR ONLY \$24.95)
- PRINTING TO GO. (4 DISK SIDES OF GRAPHX CLIPART/FONTS)...\$9.95
- GRAPHX DINOSAURS! BY KEN GILLILAND..STONEAGE CLIPART...\$12.95
- MAC-FLICK (SUPER HIGH RES CLIPART) 6 DISK SIDES).....\$12.95

SPECIAL, DEDUCT \$5 FROM GRAPHX WHEN ORDERED WITH ANY OTHER GRAPHX CLIP/FONT PACKAGE ON THIS PAGE!



TEX+COMP

America's Number One TI computer retailer

P.O. Box 33084, Granada Hills, CA 91344

(818) 366-6631

24 Hour Order Line



AUTHORIZED DEALER

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mississippi 4 1/2%. Add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.

NOTE: Payment in full must accompany all orders. Credit card. Company check or Money order for immediate shipment. Personal Checks require up to 4 weeks to clear. California orders add 8 1/2% sales tax.



Contents

MICROpendium

MICROpendium (ISSN 10432299) is published monthly for \$25 per year by Burns-Koloen Communications Inc., 16606 Terrace Dr., Austin, TX 78728-1156. Second-class postage paid at Austin, Texas, and additional mailing offices. POSTMASTER: Send address changes to MICROpendium, P.O. Box 1343, Round Rock, TX 78680-1343.

No information published in the pages of MICROpendium may be used without permission of the publisher, Burns-Koloen Communications Inc. Only computer user groups that have exchange agreements with MICROpendium may excerpt articles appearing in MICROpendium without prior approval.

While all efforts are directed at providing factual and true information in published articles, the publisher cannot accept responsibility for errors that appear in advertising or text appearing in MICROpendium. The inclusion of brand names in text does not constitute an endorsement of any product by the publisher. Statements published by MICROpendium which reflect erroneously on individuals, products or companies will be corrected upon contacting the publisher.

Unless the author specifies, letters will be treated as unconditionally assigned for publication, copyright purposes and use in any other publication or brochure and are subject to MICROpendium's unrestricted right to edit and comment.

Display advertising deadlines and rates are available upon request.

All correspondence should be mailed to MICROpendium at P.O. Box 1343, Round Rock, TX 78680. We cannot take responsibility for unsolicited manuscripts but will give consideration to anything sent to the above address. Manuscripts will be returned only if a self-addressed stamped envelope is included.

Foreign subscriptions are \$30.25 (Mexico); \$32.50 (Canada); \$30.00, surface mail to other countries; \$42 airmail to other countries.

All editions of MICROpendium are mailed from the Round Rock (Texas) Post Office.

Mailing address: P.O. Box 1343, Round Rock TX 78680

Telephone: (512) 255-1512

CompuServe: 75156,3270

Delphi TI NET: MICROPENDIUM

GENie: J.Koloen

John Koloen.....Publisher
Laura Burns.....Editor

Regena on BASIC

Accordion Solitaire.....Page 8

Extended BASIC

Programming in the dark.....Page 11

Bad Weather Golf

Play on your computer if it's raining on the links.....Page 15

The Lima MUG Conference

TIM, harnessing the 99105 chip, and more.....Page 19

BASIC/Assembly

Taking a snapshot and developing it into source code....Page 25

MY-BASIC

Update for MY-PAINT and some odds and ends.....Page 29

Deciphering Fast-Term Parameters

Figuring out how they were written.....Page 30

Reviews

Ti Image Maker.....Page 33

Newsbytes

A TI-Artist Plus! Pak from Texaments, and OPA begins work on the RICH GKXB cartridge.....Page 34

The TI-BASE Users' Guide

Creating queries on the fly.....Page 36

User Notes

A program to match days with dates, Multiplan comparisons and adding video RAM to the Geneve.....Page 37

Classified.....Page 39

***READ THIS**

Here are some tips to help you when entering programs from MICROpendium:
1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation points at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the October 1987 edition.
2. Long XBASIC lines are entered by inputting until the screen stops accepting characters, pressing Enter, pressing FCTN REDO, cursoring to the end of the line and continuing input.

Comments

Congratulations to Lima

Last month's TI fair in Lima, Ohio, appears to have been another successful gathering with 300 attending. Congratulations to this small user group for putting on such a classy event.

Among the most noteworthy happenings was OPA's demonstration of its Ti Image Maker hardware (see review in this issue). For more information about the fair turn to page 19. Unfortunately, one project that wasn't in shape for a successful demo was the 99105 accelerator for the TI. The hand-wired prototype Don O'Neil brought from California was damaged in flight. This device will turn the TI99/4A into a 12 megahertz speed demon and Horizon sells it for \$250. We will have more about it next month.

A NEW COLUMNIST COMES ON BOARD, ANOTHER LEAVES

We want to wish our newest columnist, Bruce Harrison, a belated welcome to MICROpendium. Bruce is writing an assembly language column called The Art of Assembly. The column started last month. But don't look for it this month. We got it too late for the June issue, but we'll pick it up next month.

Harry Brashear, who has written MICRO-Reviews for eons will be publishing his last column in July. Harry has become a partner in Asgard Software and is giving up the column to avoid conflict of interest.

ABOUT MYARC

Just so everyone knows, I do not have anything against Myarc Inc. Myarc has done a lot for the TI community and I am sure most users wish the company nothing but the best. Their hard and floppy disk controller is still one of the best products marketed

for the TI and the Geneve remains an outstanding achievement. While other companies that have produced hardware for the TI have long ago fallen to the wayside, Myarc remains. I appreciate the ability to survive despite the odds, and Myarc has proven itself a survivor. The company just needs to work a little bit harder on its PR.

Some of Myarc's problems apparently stem from piracy of its MY-Art program for the Geneve. According to Tom Wills, who spoke to Jack Riley recently, Myarc is suffering because it isn't making any money from the program. Wills says that Riley has even seen the program being given away at TI fairs as if it were in the public domain. The program is copyrighted and those who pirate it are breaking the law. It's unfortunate that such thoughtless, if not devious, users are hurting the entire TI/Geneve community by denying authors and manufacturers funds from the sale of their products. The day will come when talented programmers won't write for the TI for fear of piracy. Who can blame them? Certainly not the pirates.

By the way, the new policy for getting HFDCs repaired is to send the defective card to Myarc in New Jersey along with a cashier's check for \$75.

ASGARD AND THE MIDI

Contrary to information published last month, Asgard Software will continue to be involved with MIDI-Master, by Mike Maksimik. Asgard's Chris Bobbitt left a message on our answering machine to the effect that Asgard would be involved as at least a dealer for MIDI-Master.

—JK

1991 TI FAIRS

MARCH

Family Computer Exposition and Ham Radio Festival, (formerly TICOFF), March 6, Roselle Park High School, 185 West Webster Ave., Roselle Park NJ 07204. Sponsored by students of the high school and the Old Bridge Ham Radio Club. For information write the high school or call (201) 241-4550 or call the 24-hour informational BBS at (201) 241-8902.

APRIL

Northeast TI99/4A Home Computer Fair, April 6, Central Middle School, Waltham, Massachusetts. Contact Justin Dowling, The Boston Computer Society, One Center Plaza, Boston, MA 02108.

Canadian TI-Fest, April 27, Merivale High School, Nepean, Ontario, Canada. Contact Bill Gard, 3489 Paul Anka Dr., Ottawa, Ontario, Canada K1V 9K6 or (613) 523-9396 or Fax (819) 997-2194 Attn: DMES 2.

MAY

TI Orphan Reunion, May 11, Innisfail Lions Hall, Innisfail, Alberta, Canada. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada T0M 1X0 or (403) 638-3916.

TI99/4A Users Group, UK, Annual Meet, May 11, The Music Hall, The Square, Shrewsbury, England. Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire, England, SK4 5AH.

Multi User Group Conference, May 18, Reed Hall, Ohio State

University Lima Campus. Contact the Lima User Group, P.O. Box 647, Venedocia, OH 45894, or phone Dave Szippel evenings, (419) 228-7109.

SEPTEMBER

6th International TI User Treffen, Sept. 13-15, Berlin. Contact Henry Hillsberg, Uhlandstr. 70, (W) 1000 Berlin 31, Germany.

Convention, weekend of Sept. 21, Tacoma, Washington. Contact Barb Wiederhold, (206) 546-1865 (BBS) or (206) 546-1205.

NOVEMBER

Chicago International World Faire, Nov. 1-2, Elk Grove Holiday Inn, Elk Grove Village, Illinois. Contact Chicago TI Users Group, P.O. Box 578341, Chicago, IL 60657.

1992 TI FAIRS

FEBRUARY

Fest-West, Feb. 15-16, Phoenix, Arizona. Contact VAST Users Group, c/o Tom Pfeffer, 116 S. Stellar Parkway, Chandler, AZ 85226.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. Send information to MICROpendium Fairs, P.O. Box 1343, Round Rock, TX 78680.

Feedback

Neglected points

I was glad to see a review of my tutorial in the April issue. However, I feel Harry neglected to mention a few points which need to be covered.

First, the name of the tutorial is A Beginner's Guide to Turbo-Pasc '99.

Second, the tutorial consists of 24 programs which can be run from E/A option 5 without the Turbo-Pasc '99 package, giving you the opportunity to explore the Pascal language without investing a great deal, then, if it looks promising, you can purchase Turbo-Pasc '99.

Third, in all fairness to the TP '99 manual, it does a good job of explaining the editor, compiler and linker. However, it suffers from a malady that seems to be common to all advanced language manuals for the TI; it assumes you know the language already, making it tough on beginners.

Fourth, in the February feedback Phil Martin writes of the frustration of working with most advanced languages: The need to edit a program, compile it, assemble it, then run the program before you discover any errors, thus making debugging a lengthy, frustrating process. Well, an end to the frustration is here with TP '99. The compiler is an integral part of the editor, making syntax checking a snap. When you desire to check for errors, simply drop to the editor command line and type CO. A simulated compile is then executed which will catch everything except runtime errors (errors where the syntax is correct but you do something silly such as divide by zero). During the simulated compile, if an error is found the cursor drops back into the editor, usually just past or on the error. Once you do compile and assemble the program, if, during program execution, a runtime error is generated an error message is displayed on screen along with the line number of the error, making it a simple matter to find that line in the editor.

Fifth, not only does the tutorial make comparison to XBASIC, but it shows the ease of converting from BASIC to Pascal, including virtual line-by-line translations. Also, tips are given on creating a master file of procedures (subroutines) and merg-

ing them into your Pascal programs using TI-Writer or the E/A editor.

Dan O'Quinn
Walterboro, South Carolina

Packet Radio terminal

I am responding to Mark Edwards' request for a Packet Radio terminal program. Almost any of the existing terminal programs can be used for Packet Radio. I have used Mass Transfer in the past because of the printer spooling feature. At present, I am using Triad. This has the advantage of memory-resident terminal emulator, disk manager and editor. I have a Terminal Node Controller (TNC) model MFJ-1274, connected to the serial port on my RS232 via null modem cable. The TNC has a built-in modem, battery-backed 16K RAM and holds in memory 98 programmable parameters. I use 300 as the computer baud rate (which is *not* related to the radio rate of 1200) and 7-bit words, even parity.

Richard R. Hay
Amateur Radio WILE
San Diego, California

Program to help with user's HFDC problem

I would like to reply to Eric Wilson (Feedback, April '91). Yes, Eric, a program to help with your problem has been developed. The name of the program is Emulation Management Utilities and will be marketed by Asgard in the near future.

As you know, the HFDC has provision for DSK1 emulation in both directory and file emulation formats. The directory emulation has the limit of 127 files and is a little limited for general use. DSK1 file emulations produce a copy of the floppy disk "archived" into one file on the hard disk. Each emulation can store up to 127 files or enough files to fill it. Any number of emulation files can be stored on the hard disk but only one can be active at any one time. The active emulation is then treated as DSK1, for both reading and writing as well as low level (sector) access. Till now, the only way of changing from one emulation to another was to use MDM5 and this tended to be a little cumbersome.

EMU is a menuing program that will ac-

tivate the required emulation file and run a program from that file automatically. This means that you are able to store your favorite software on the hard disk and run it with a single key stroke. The menu is easily configurable and caters for 40 options. EMU will also list all the emulation files on the hard disk, do a directory of the files in the emulation and, perhaps its most useful utility, allow the user to create an emulate file without having to copy it from a floppy disk. Using this feature, you can create disk sizes of SSSD, DSSD, DSDD and DSQD as well as a special size giving more than 3,100 sectors available for your use.

Contact Asgard Software for more information about a release date.

Garry J. Christensen
Deception Bay, Australia

Applause for series

Please bring us more articles like Barry Traver's GRAPHICOMP series. This well-written, informative series of articles re-kindled my interest in XB programming.

Keith Bergman
Toledo, Ohio

GenPROG problems

I have a Geneve with the HFDC and I have purchased the GenPROG set of four programs by J. Paul Charlton and am having difficulties in some areas. I have started trying to use the LINKER program with a very small object file (I know is correct for the 4A) which includes a BLWP to DSRLNK to try to include this routine in the resulting program file so I can make a program image file which contains all routines needed. I tried to link it with the following control file:

```
* PF C HDS1.DSRONLYCTL 04/30/91
LIST HDS1.ASM.DSRLINKL
BLOCK >A000,>FFD8
ADD DSK1.DSRONLYOBK
CLEAR
BLOCK SFIRST,SLAST
BLOCK >2000,>24F4
LIBREF "A:LIB__4A"
STATUS
UNDEF
SAVEALL DSK1.DSRTST1,5
```

(See Page 7)

Feedback

(Continued from Page 6)

EXIT

and the listing produced from running this control file follows:

```
BLOCK >A000,>FFD8
ADD DSK1.DSRONLYOBK
CLEAR
BLOCK SFIRST,SLAST
BLOCK >2000,>24F4
LIBREF "A:LIB_4A"
STATUS
```

Block status:

| Start | Current | End |
|-------|---------|------|
| A000 | A000 | A006 |
| 2000 | 2000 | 24F4 |

Total Free: >04FA, >04F4 in largest section.

1 unresolved REF entries.

3 DEF entries in table.

EVAL SLAST-SFIRST

Value: 0006

SYMTAB

DEF table listing:

A000 SFIRST

A006 SLAST

A000 START

UNDEF

Undefined REF listing:

A002 DSRLNK

SAVEALL DSK1.DSRTST1,5

There are unresolved REFS,

Continue? (Y/N) NY

EXIT

As you can see from the link listing, it failed to find DSRLNK in LIB_4A library. I also tried this exact same thing looking for VMBR in LIB_4A and it failed to find that, too.

Also, strange things happened like it would not find the control file until I put it in my root directory and executed LINK from the root directory. It even failed to find the control file when I put it on a floppy and said look on drive A: or DSK1. It also failed when I executed LINK from a directory .ASM and had all files in .ASM both with "LINK DIRONLYCTL" AND "LINK HDS1.ASM.DIRONLYCTL". I don't know if it ever found my LIB_4A in the above case, but other ways I tried seemed to get me in a loop of "unrecognized header" messages scrolling up the screen. I tried to let it run and counted more than 200 of these messages before I cancelled it. Others might have the same

problems trying to run LINK. I would appreciate if you could try to see if Paul or anybody else has answers to these problems. Thank you very much.

Norm Sellers
Broomall, Pennsylvania

We can only hope that knowledgeable readers will be able to help you overcome the problems. A User Note would be greatly appreciated.

Turning numbers white stumps reader

The subject program from the March 1988 issue for turning numbers white has been giving me a serious problem. Since the program is short I am including it.

```
10 REM Turns all numerals and punctua-
tion white. By HARRY WILHELM !146
20 REM Turn on by CALL
LOAD(-31804,63) Turn off by CALL
LOAD(-31804,0) !095
50 CALL INIT !157
60 CALL LOAD(16128,2,224,38,0,2,0,8,17
,2,1,63,36,2,2,0,3,4,32,32,36,2,224,131,192
,3,128) !001
70 CALL LOAD(16164,240,240,240) !001
80 CALL LOAD(-31804,63) !107
```

In the body of the program description the article states, "the program remains in effect until the computer is turned off until CALL LOAD(-31804,0) is executed or the computer is reset."

This is just what is needed *except* it does not work that way. Yes, the program turns the numerals and punctuation white, but it will not "turn off" with the CALL LOAD(31804,0) program line.

I have looked through the MICROpendium issues following the March 1988 issue and find nothing in the Feedback section regarding this program. Please advise me how to turn the "TURNWHITE" program *off* and not have to reset the computer.

Jim Miller
Salem, Oregon

Although there was a transposition error in the version of the program you sent us (which we corrected in the above listing), we ran the above program and it worked fine, turning numeric characters white. By issuing the CALL

LOAD(-31804,0) the white characters cleared to their normal black. Perhaps the transposition — 16218 instead of 16128 in your letter in line 60 — was the problem. However, when we ran it with 16218, the computer locked up.

Windows 2.0 review receives clarifications

In regard to my Windows 2.0 review (May 1991), I would like to clarify a couple of things. After discussion with Beery Miller at Lima, I have discovered that most programs will release memory when you are finished with them. However, TPA is not one of them (though the program name is still listed as swappable). Also, in the next version of Windows, the 64K of memory saved for VDP restoration should be releasable, along with some other enhancements. And, for previous owners, to update from 1.0 to 2.0 will cost \$10 plus your original disk (or maybe just your serial number). Check with Miller for complete details.

Doug Phelps
Somerset, Kentucky

The Feedback column is a forum for TI99/4A and Geneve users. The editor will condense submissions when necessary to conserve space. We ask readers to restrict themselves to one subject for the sake of simplicity. Mail Feedback items to MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

USER GROUP UPDATE

These are additions and updates to our user group listings, begun in our May 1987 issue.

Massachusetts

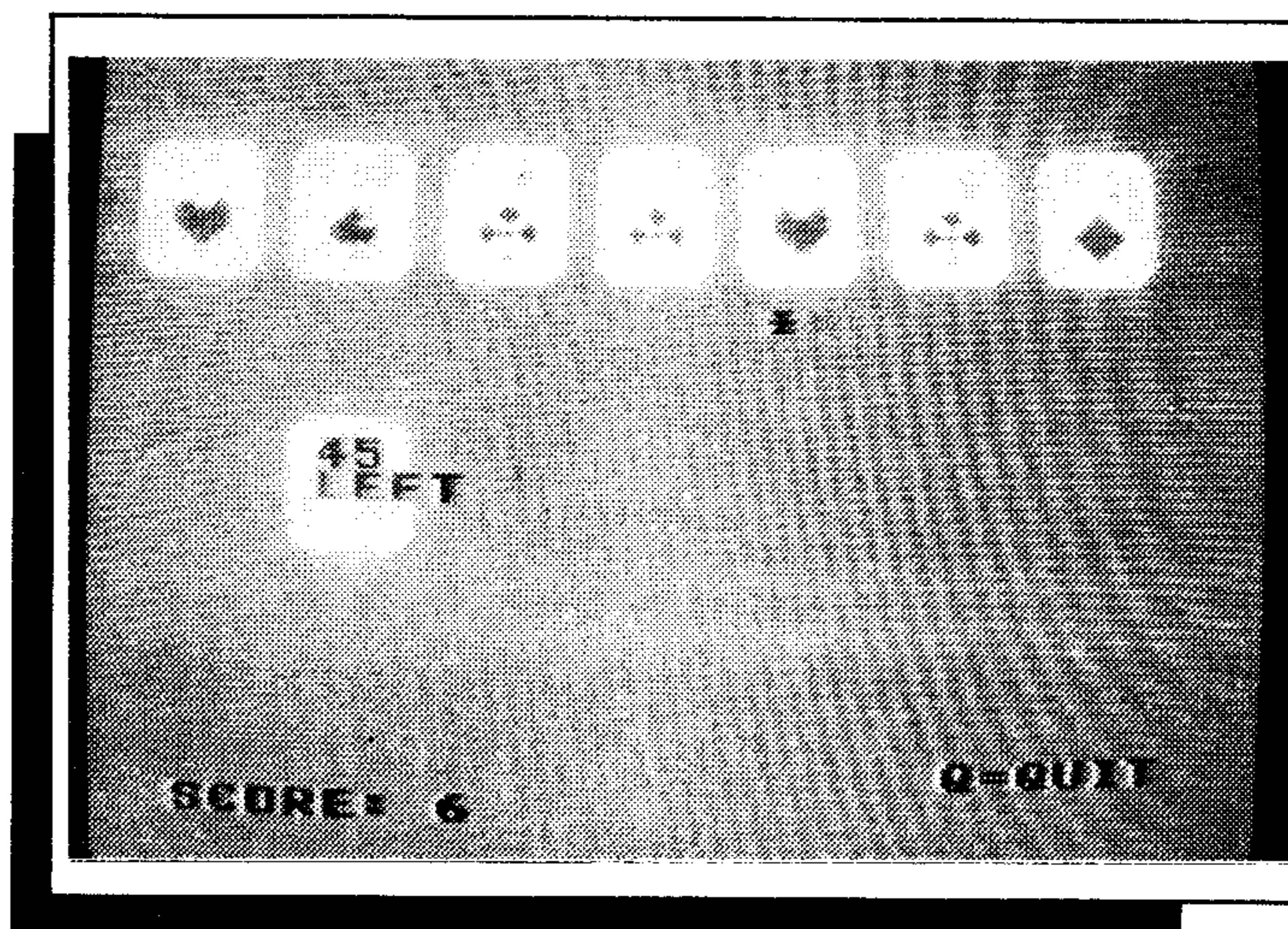
Boston Computer Society, TI99/4A User Group, 1 Kendall Square, Cambridge, MA 02139-1562 (new address).

BASIC

Accordion Solitaire

By REGENA

Here is another card solitaire game. This game is called "Accordion" and uses a standard deck of 52 cards. Seven cards are dealt face up from left to right across the screen for the starting tableau. Any one of the cards showing can be matched to a card one to the left or two to the left by matching either the number or the suit. The card is picked up and moved on top of the matching card to the left, completely covering any card(s) underneath. The cards to the right are each moved one position to the left to fill the blank space. A new card is dealt in the seventh position.



Only the card showing can be matched with another, and when it is moved, the whole stack of cards which may be under it is moved at the same time. Cards may only be moved toward the left, and new cards are dealt one at a time on the right. The object of the game is to move all cards leftward, eventually ending up with all 52 cards in the far left position.

You score three points each time you move a card (or stack of cards) to the left. When you move cards onto the far left position, you get three points for each card in the stack, plus a bonus three points. If you can't get all the cards in the far left position, see how high a score you can get. I got lucky while testing this and got 270. My son Randy tested the program and scored 291 on his second game.

If you are playing with regular cards, you may wish to make the game less complex by starting with 10 cards showing or with 13 cards showing. The scoring is based on the difficulty level. The computer version is Level 3. Ten cards is Level 2 and 13 cards is Level 1. To score in the easier levels, let x equal the level number. Each time you move a card (or stack) to the left, the score is increased by x . Each time you move a card (or stack) into the far left position, the score is increased by x times the number of cards, plus x . In my hurry to get the program ready for publication, I included only Level 3.

The graphics card design is slightly different from the other card solitaire games I have published (Pyramid, Fourcard and Poker Solitaire). The width of each card uses four characters, but the side characters are only half white. This way seven cards can fit across the screen with apparent blank spaces between each. The suit of the cards is actually four redefined graphic characters — so you can clearly tell which suit is which.

The heart and diamond are defined in Characters 88-95, and the spade and club are defined in Characters 96-103. Characters 104-111 define the white blank card. Red numbers are Characters 112-124, and black numbers are Characters 128-140. I was trying

to avoid defining characters in Sets 15 and 16, so you may adapt this program to Extended BASIC.

Since I used characters in the set including the last three letters of the alphabet, the character "\$" is redefined as a "Y" to print the instruction screens.

CARD(52) are the 52 cards of the deck, and while the screen says "shuffling," the array is actually just being initialized to zero elements. The subroutine starting at Line 1420 deals the cards. Line 1540 randomly

chooses a card, and Lines 1550-1560 make sure the card has not previously been used. Depending on the number chosen, the SUIT and NC (number of the card) can be determined. SS is the beginning character number for the suit. The subroutine at Lines 1610-1720 draws the card.

Toward the end of the deck, it may take longer to deal the seventh position card because the computer is randomly choosing cards and checking to make sure they have not been used. Lines 1450-1480 find the last card by simply going through the array rather than trying random choices.

When a card is moved, cards need to be redrawn on the screen. Only the card number and suit need to be changed, not the whole card outline. Lines 1730-1840 draw a blank white card at the beginning of the game, then Lines 1610-1720 draw the number and suit when needed.

Near the end of the game, when the deck is out of cards, the right positions become blank. MP is the farthest right position, which starts at 7. Lines 1490-1520 erase a card when it is moved and there are no more cards to be dealt. DECK is the number of cards left to be dealt.

J and K are the coordinates where a card is drawn. P is the position number, 1 through 7. T(P,1) is the suit of the card in position P, and T(P,2) is the card number. When a card is first chosen, the position is P1. The second card is at position P, and P1-P must be 1 or 2. The suits and numbers are compared to see whether a match is made. X(P) is the K coordinate for the card in position P. N(P) is the number of cards in the position P, which is used in scoring. The variable B is used as a counter in various FOR-NEXT loops.

If you wish to save typing effort, you may have a copy of this program by sending \$4 to REGENA, 918 Cedar Knolls West, Cedar City, UT 84720. Be sure to specify that you need "Accordion" for the TI and whether you want cassette or diskette.

(Program listing on Page 9)

REGENA—

```

100 REM ACCORDION !108
110 REM BY REGENA !071
120 DIM CARD(52),T(7,2),N(7)
,X(7)!074
130 CALL CLEAR !209
140 PRINT TAB(5); "*** ACCORDI
ON ***" !007
150 CALL CHAR(36,"0044442838
10101")!168
160 FOR C=1 TO 7 !056
170 X(C)=C*4 !201
180 NEXT C !217
190 PRINT : "SELECT A CARD
B$ USING THE LEFT OR RIGHT
ARROW KE$ THENPRESSING THE S
PACE BAR." !087
200 J=4 !005
210 CALL COLOR(8,7,16)!238
220 PRINT : "MOVE IT B$ MATCH
ING THE SUIT" !127
230 CALL COLOR(9,2,16)!234
240 PRINT "OR THE NUMBER TO
A CARD ONE" !105
250 CALL COLOR(10,16,1)!018
260 PRINT "OR TWO POSITIONS
TO THE LEFT AND PRESS TH
E SPACE BARAGAIN." !131
270 CALL COLOR(11,7,16)!025
280 CALL COLOR(12,7,16)!026
290 CALL COLOR(13,2,16)!022
300 CALL COLOR(14,2,16)!023
310 PRINT : "TR$ TO MOVE ALL
CARDS TO THEFAR LEFT POSITIO
N." !091
320 FOR C=88 TO 140 !216
330 READ C$ !254
340 CALL CHAR(C,C$)!081
350 NEXT C !217
360 REM SUIT !031
370 DATA 000C1E3F3F3F3F,00
183C7EFEFEFEF,1F0F070301,FC
F8F0E0C0808,0000000103070F1F
,000080C0E0F0F8FC !136
380 DATA 3F1F0F070301,FEFCF8
F0E0C08,0000000103070F1F,008
080C0E0F0F8FC,1F1F0F06000001
,FCFCF8B08080C !156
390 DATA 000001030301183C,00
00C0E0E0C08C9E,3F3C180000000
1,FE9E8C808080C !143
400 REM CARD !244
410 DATA 000000000103070F,00
000000FFFFFF,0000000080C0E
0F,0F0F0F0F0F0F0F0F,0F0F0F0
F0F0F0F,0F070301,FFFFFFF !1
31
420 DATA F0E0C08 !248
430 REM NUMBERS !246
440 DATA 18242424243C2424 !1
74
450 DATA 1824040408103C,3C04
0418040438,202424243E0404,3C
403804042438,1C20203C24241C,
3C04040808101 !005
460 DATA 18242418242418,1C24
241C040404,8C92929292928C,04
040404042418,384444444444C34,
24283028282424,0,0,0 !089
470 DATA 18242424243C2424 !1
74
480 DATA 1824040408103C,3C04
0418040438,202424243E0404,3C
403804042438,1C20203C24241C,
3C04040808101 !005
490 DATA 18242418242418,1C24
241C040404,8C92929292928C,04
040404042418,384444444444C34,
24283028282424 !085
500 PRINT : "PRESS <ENTER>
TO START." !040
510 CALL KEY(3,KEY,S)!092
520 IF KEY<>13 THEN 510 !146
530 CALL CLEAR !209
540 PRINT "SHUFFLING ..." !1
92
550 FOR C=1 TO 52 !105
560 CARD(C)=0 !129
570 NEXT C !217
580 DECK=52 !006
590 CALL CLEAR !209
600 PRINT TAB(22);"Q=QUIT" !
133
610 PRINT "SCORE:" !031
620 FOR C=1 TO 7 !056
630 K=X(C)!017
640 GOSUB 1740 !034
650 GOSUB 1430 !235
660 T(C,1)=SUIT !180
670 T(C,2)=NC !001
680 N(C)=1 !182
690 NEXT C !217
700 J=12 !053
710 K=8 !010
720 GOSUB 1740 !034
730 J=4 !005
740 MP=7 !091
750 SCORE=6 !057
760 GOSUB 1900 !195
770 ROW=8 !183
780 CALL HCHAR(13,7,76)!008
790 CALL HCHAR(13,8,69)!011
800 CALL HCHAR(13,9,70)!004
810 CALL HCHAR(13,10,84)!050
820 REM START MOVING !088
830 ND$=STR$(DECK)&CHR$(125)
!049
840 FOR B=1 TO 2 !050
850 CALL HCHAR(12,6+B,ASC(SE
G$(ND$,B,1)))!184
860 NEXT B !216
870 P=MP !171
880 CALL HCHAR(ROW,3,32,28)!
173
890 P1=0 !056
900 CALL KEY(3,KEY,S)!092
910 CALL HCHAR(ROW,X(P),42)!
224
920 CALL HCHAR(ROW,X(P),32)!
223
930 IF S<1 THEN 900 !144
940 IF (KEY=81)+(KEY=113)THE
N 1950 !030
950 IF KEY<>32 THEN 1010 !13
7
960 IF P1<>0 THEN 1130 !100
970 CALL SOUND(100,1400,2)!1
74
980 CALL HCHAR(ROW,X(P)-1,42
,2)!074
990 P1=P !143
1000 GOTO 900 !214
1010 IF (KEY<>83)+(KEY<>115)
=-2 THEN 1080 !182
1020 IF P>1 THEN 1050 !037
1030 CALL SOUND(100,131,2)!1
25
1040 GOTO 900 !214
1050 CALL SOUND(100,1400,2)!
174
1060 P=P-1 !026
1070 GOTO 900 !214
1080 IF (KEY<>68)+(KEY<>100)
=-2 THEN 900 !254
1090 IF P=MP THEN 1030 !178
1100 CALL SOUND(100,1400,2)!
174
1110 P=P+1 !025
1120 GOTO 900 !214
1130 IF P>=P1 THEN 880 !191
1140 IF P1-P>2 THEN 880 !190
1150 CALL SOUND(100,1400,2)!
174

```

(See Page 10)

REGENA ON BASIC —

(Continued from Page 9)

```

1160 CALL HCHAR(ROW,X(P)-1,4
2,2)!074
1170 IF (T(P1,1)=T(P,1))+T(
P1,2)=T(P,2)) THEN 1200 !036
1180 CALL SOUND(100,131,2)!1
25
1190 GOTO 880 !194
1200 K=X(P)!030
1210 SUIT=T(P1,1)!242
1220 NC=T(P1,2)!063
1230 GOSUB 1620 !170
1240 GOSUB 1860 !155
1250 N(P)=N(P)+N(P1)!209
1260 T(P,1)=T(P1,1)!107
1270 T(P,2)=T(P1,2)!109
1280 FOR B=P1 TO MP-1 !023
1290 N(B)=N(B+1)!115
1300 T(B,1)=T(B+1,1)!217
1310 T(B,2)=T(B+1,2)!219
1320 K=X(B)!016
1330 SUIT=T(B,1)!179
1340 NC=T(B,2)!000
1350 GOSUB 1620 !170
1360 NEXT B !216
1370 K=X(MP)!107
1380 GOSUB 1430 !235
1390 T(7,1)=SUIT !113
1400 T(7,2)=NC !190
1410 GOTO 830 !144
1420 REM DEAL NEW CARD !052
1430 RANDOMIZE !149
1440 IF DECK>1 THEN 1540 !21
6
1450 IF DECK=0 THEN 1490 !16
2
1460 FOR CC=1 TO 52 !172
1470 IF CARD(CC)=0 THEN 1560
!223
1480 NEXT CC !028
1490 FOR B=K-2 TO K+1 !075
1500 CALL VCHAR(J-1,B,32,5)!
217
1510 NEXT B !216
1520 MP=MP-1 !180
1530 GOTO 1720 !013
1540 CC=INT(52*RND)+1 !006
1550 IF CARD(CC)<>0 THEN 154
0 !140
1560 CARD(CC)=1 !197
1570 SUIT=INT((CC-1)/13)!224
1580 NC=CC-13*SUIT !205
1590 SUIT=SUIT+1 !003
1600 DECK=DECK-1 !168
1610 REM DRAW CARD !066
1620 CALL SOUND(100,592,2)!1
36
1630 SS=SUIT*4+84 !096
1640 CALL HCHAR(J+1,K-1,SS)!
085
1650 CALL HCHAR(J+1,K,SS+1)!
084
1660 CALL HCHAR(J+2,K-1,SS+2
)!018
1670 CALL HCHAR(J+2,K,SS+3)!
087
1680 IF SUIT>2 THEN 1710 !17
7
1690 CALL HCHAR(J,K,111+NC)!
232
1700 GOTO 1720 !013
1710 CALL HCHAR(J,K,127+NC)!
239
1720 RETURN !136
1730 REM BLANK CARD !124
1740 CALL HCHAR(J-1,K-2,104)
!017
1750 CALL HCHAR(J-1,K-1,105,
2)!191
1760 CALL HCHAR(J-1,K+1,106)
!017
1770 CALL VCHAR(J,K-2,107,3)
!021
1780 CALL VCHAR(J,K-1,125,3)
!020
1790 CALL VCHAR(J,K,125,3)!0
88
1800 CALL VCHAR(J,K+1,108,3)
!020
1810 CALL HCHAR(J+3,K-2,109)
!023
1820 CALL HCHAR(J+3,K-1,110,
2)!188
1830 CALL HCHAR(J+3,K+1,111)
!014
1840 RETURN !136
1850 REM SCORE !086
1860 IF P=1 THEN 1890 !110
1870 SCORE=SCORE+3 !115
1880 GOTO 1900 !194
1890 SCORE=SCORE+3*(N(P1)+1)
!154
1900 SC$=STR$(SCORE)!060
1910 FOR B=1 TO LEN(SC$)!051
1920 CALL HCHAR(23,9+B,ASC(S
EG$(SC$,B,1)))!193
1930 NEXT B !216
1940 RETURN !136
1950 CALL CLEAR !209
1960 PRINT "SCORE: ";SCORE
!145
1970 IF HS>SCORE THEN 1990 !
161
1980 HS=SCORE !213
1990 PRINT "HIGH SCORE: ";
HS !170
2000 PRINT : : : "TR$ AGAIN?
($/N)" !078
2010 CALL KEY(3,KEY,S)!092
2020 IF (KEY=89)+(KEY=121)TH
EN 530 !148
2030 IF (KEY<>78)+(KEY<>110)
=-2 THEN 2010 !090
2040 CALL HCHAR(23,1,32,28)!
226
2050 PRINT : : : !187
2060 END !139

```

OPA 'star' of Ottawa fair; UK fair attendance low

Reports on recent fairs in Canada and England have been received by MICROpendium.

Lucie Dorais says that the star of Ottawa's TI-Fest April 27 "was undeniably Gary Bowser of OPA (Oasis Pensive Acubators)." Bowser's demonstration of the Tiny T.I.M. board, based on the V9958 Video Display Processor, was done with 80-column Funnelweb and with Y.A.P.P., showing GIF pictures.

She says participation was smaller than last

year but attendance about the same. William Gard organized the event.

According to Stephen Shaw, attendance at the AGM of the TI99/4A Users Group UK May 11 in Shrewsbury was only 22 persons, of whom 10 were appointed officers. However, he notes, membership levels have held well during the year. At the 1991 AGM membership totaled 165, including 40 due to renew.

"There is a steady trade in modules, but

members' requests for disk and cassette software are in severe decline," he writes.

Attending the AGM was French member Jean Louis Cangy and his wife. Cangy "brought along a self-built 'Maxi-Mem' which plugged into the module slot and operated as a GRAM-cracker device, but with Editor/Assembler and Turbo-Copy included as switched options." A Quest RAM-disk from Australia was also demonstrated, as well as software.

E X T E N D E D B A S I C

Programming in the Dark

By **JERRY STERN**

©1991 J.L. Stern

Did you ever notice how hobbies mix into each other? A stamp-collecting geographer searches for stamps with maps on them. A gardening woodworker builds planting boxes for perennial blooms. A quilt-making doll collector sews doll-sized miniature quilts. And I use a computer to help me calculate photographic development times, temperatures, and magnifications. This month's program is DARKTIME, a photographic calculator. For non-photographers, the program includes a metric converter, and the menus probably could be converted to provide calculations for yet another hobby.

First, here's a little background for those new to the photographic darkroom. When developing black and white film, the chemicals are used at room temperature, but that temperature must be known. Warmer chemicals work more quickly than colder chemicals, and there are conversion factors for that difference. Also, "push processing" a film, or increasing the development time of a roll of film to make it more sensitive to light, is done by lengthening the development time by a certain proportion. Finally, there are two ways to agitate the film during development — continuously, as on an automatic film drum processor, or manually, by turning the film tank over for five seconds out of every thirty. The continuous agitation technique works slightly faster. Kodak has published several very fancy and expensive dataguides that use a sliding wheel to calculate these factors, or it can be done with a calculator, but I prefer automation. Given the development time at any temperature, the new temperature, and the options for agitation and pushing, DARKTIME calculates the new development time, and converts the computer screen into a fancy timer for the development process.

That one calculation is the main function of DARKTIME. The other features form a photographer's calculator, good for calculating flash exposures, magnification for macro work, and enlargement exposures at different enlarger heights. I can

never remember that formula for magnification — I added it to the program after I had to look it up for the umpteenth time.

A specialty calculator program is written by nesting menus for all the special formulas needed for that application, and then adding any special-purpose subprograms for the more complex functions. In DARKTIME, the special purpose subprogram is TIMER. It counts down to zero from whatever time is set, clicking once per second, chiming every thirty seconds as a reminder to turn over the film tank for agitation, and buzzing when the time set has elapsed.

Like most subprograms, TIMER can be separated from its main program, and added to other programs, but there are some extra steps to follow to move TIMER to another home. First, TIMER uses sprites for the clock display, but it does not erase them. If it erased the sprites when it finished timing, the display would disappear too soon, so add CALL DEL-SPRITE(ALL) to your new program to clear the sprite display at the proper time. Second, TIMER does its own input request for the amount of time to count down, in lines 27885 to 27900, and there are no variables passed to TIMER from the main program. To set a default time, display the minutes at row 16, column 8, and the seconds at row 17, column 8, as in lines 500 and 510. TIMER will use an ACCEPT AT statement with a negative SIZE option to pull these numbers into the timing process.

TIMER and DARKTIME were calibrated on a 99/4A. If TIMER is run on a Geneve, the timer might run too fast. The calibration delay is on line 27955, and uses a CALL SOUND(178,130,30) statement to provide a silent pause between beeps. The faster 9640 will need a larger number as a replacement for the 178 thousandths of a second delay.

Once the TIMER is running, it may be stopped by pressing the space bar, and restarted by pressing ENTER. To cancel the timing sequence and return to the main program, press function AID (function 7).

The other calculation functions of DARKTIME are simple algebra, but a series of menus chooses the correct menu

line. Rather than use a menu routine for each selection, the subprogram MENU, starting on line 30595, creates a menu from a list of the options for each choice. For example, MENU is called on line 320, using the list of options from A\$, which is built in line 190 to 220. MENU examines A\$, allows 23 characters for each description, and decides how many options should be listed. If the string ends in "QUIT" MENU will display only those choices, but if "QUIT" does not end the string, an extra choice for "MAIN MENU" will be added at the end of the list. Notice that each menu choice is padded out with blanks to the 23 character size. Not all programs will need menus with descriptions 23 characters long. That number is set in line 30610, and a menu string of "Add Sub Div MultQUIT" would use just a four-character menu line.

Let's see ... A stamp-collecting geographer could modify MENU and DARKTIME's calculator structure to calculate distances to major stamp-publishing nations, like San Marino. A gardening woodworker could build a special calculator for converting the parts dimensions of his planting boxes into board feet measurements. And a quilt-making doll collector could calculate the sizes to sew miniature quilts to keep them in scale with her doll collection. Try adapting DARKTIME and MENU to your own hobbies, and see if the results keep you out of the dark(room).

DARKTIME

```
100 ! DARKTIME !244
110 ! JL Stern 6/91 XB !014
120 CALL CLEAR :: CALL BACKD
ROP(2)!110
130 ON WARNING NEXT !215
140 DIM D(9),F(14)!210
150 CALL CHAR(95,"00FF00FF")
:: DISPLAY AT(6,10):"DARKTIM
E" :: CALL HCHAR(7,12,95,8)!
247
160 DISPLAY AT(12,4):"Photog
raphic Calculator" !129
170 DISPLAY AT(19,6):"1991 J
. L. STERN" !035
180 CALL MAGNIFY(2)!223
```

(See Page 12)

EXTENDED BASIC—

(Continued from Page 11)

```

190 A$="Metric Conversions
    QUIT" !005
200 B$="Magnification
    Flash Exposure      "
    !027
210 C$="Development Time/Tem
    p Enlargement Exposures Ti
    mer                  " !073
220 A$=C$&B$&A$ !197
230 D$="Ounces to Grams
    Grams to Ounces      Po
    unds to Kilograms    Kilogra
    ms to Pounds" !099
240 E$="Ounces to Milliliter
    s Milliliters to Ounces Ga
    llons to Liters      Liters
    to Gallons" !132
250 F$="Inches to Centimeter
    s Centimeters to Inches Fe
    et to Meters        Meters
    to Feet" !016
260 G$="Fahrenheit to Celsiu
    s Celsius to Fahrenheit "
    !144
270 H$="Weight
    Fluid              Le
    ngth              Tempera
    ture" !013
280 FOR L=1 TO 14 :: READ F(
    L):: NEXT L !236
290 DATA 1.23,1.16,1.1,1.05,
    1,.95,.9,.85,.81,.78,.75,.72
    ,.69,.66 !013
300 CALL PAUSE !232
310 DISPLAY AT(2,3)ERASE ALL
    : "Main Menu" !067
320 CALL MENU(A$,X)!123
330 ON X GOTO 350,590,830,96
    0,880,1060,1680 !014
340 ! Development time and t
    emperature !022
350 DISPLAY AT(6,2): "Origina
    l Development Time?" !008
360 DISPLAY AT(7,1): "Minutes
    0      Seconds 0" !051
370 ACCEPT AT(7,9)VALIDATE(D
    IGIT)SIZE(-2):MN !111
380 ACCEPT AT(7,23)VALIDATE(D
    IGIT)SIZE(-2):SC !151
390 DISPLAY AT(8,2): "Origina
    l Temperature F?" !201
400 ACCEPT AT(9,2)VALIDATE(D
    IGIT)SIZE(2):TP :: IF TP<64
    OR TP>77 THEN DISPLAY AT(8,2
    )BEEP:"OLD TEMP. FROM 64 TO
    77?" :: GOTO 400 !183
410 DISPLAY AT(10,2): "New Te
    mperature?" !123
420 ACCEPT AT(11,2)VALIDATE(D
    IGIT)SIZE(2):TN :: IF TN<64
    OR TN>77 THEN DISPLAY AT(10
    ,2)BEEP:"NEW TEMP. FROM 64 T
    O 77?" :: GOTO 420 !036
430 CALL CLEAR :: DISPLAY AT
    (2,2): "Push Processing?" !16
    3
440 Z$="Normal Exposure Inde
    x Plus One Stop      Pl
    us Two Stops" !158
450 CALL MENU(Z$,P):: IF P=4
    THEN 310 ELSE DISPLAY AT(2,
    3): "Agitation?" !220
460 Z$="Every 30 Seconds
    Continuous" :: CALL MENU(
    Z$,A)!183
470 IF A=3 THEN 310 !047
480 MN=MN+SC/60 :: DT=MN*F(T
    N-63)/F(TP-63)*(1+(P-1)*.4)*
    (1-(A-1)*.15)!154
490 DISPLAY AT(16,1): "Minute
    s": "Seconds" !151
500 DISPLAY AT(16,8): INT(DT)
    !109
510 DISPLAY AT(17,8): INT((DT
    -INT(DT))*60)!100
520 DISPLAY AT(18,2): "Prepar
    e Timer?(Y/N)" !197
530 CALL KEY(0,K,S):: IF S<1
    THEN 530 ELSE IF K=121 OR K
    =89 OR K=13 THEN 550 ELSE IF
    K<>78 AND K<>110 THEN 530 !
    206
540 CALL PAUSE :: GOTO 310 !
    240
550 DISPLAY AT(18,2): :: DIS
    PLAY AT(2,1):!115
560 CALL TIMER !235
570 CALL PAUSE :: GOTO 310 !
    240
580 ! enlargement exposures
    !067
590 TP,TN,ND,OD,FN,FO=1 !203
600 DISPLAY AT(6,2): "Origina
    l Exposure Time?" !221
610 DISPLAY AT(7,1): "Minutes
    0      Seconds 0" !051
620 ACCEPT AT(7,9)VALIDATE(D
    IGIT)SIZE(-2):MN !111
630 ACCEPT AT(7,23)VALIDATE(
    DIGIT)SIZE(-2):SC !151
640 DISPLAY AT(8,1): "Did pap
    er Speed Change?(Y/N)" !107
650 CALL KEY(0,K,S):: IF S<1
    THEN 650 ELSE IF K=121 OR K
    =89 THEN 660 ELSE IF K=110 O
    R K=78 OR K=13 THEN 700 ELSE
    650 !177
660 DISPLAY AT(8,1): " Origin
    al Paper Speed?" !252
670 ACCEPT AT(9,2)VALIDATE(D
    IGIT)SIZE(4):TP !179
680 DISPLAY AT(10,2): "New Pa
    per Speed?" !246
690 ACCEPT AT(11,2)VALIDATE(D
    IGIT)SIZE(4):TN !219
700 DISPLAY AT(8,1): "Magnifi
    cation Change?(Y/N)" !072
710 CALL KEY(0,K,S):: IF S<1
    THEN 710 ELSE IF K=121 OR K
    =89 THEN 720 ELSE IF K=110 O
    R K=78 OR K=13 THEN 740 ELSE
    710 !141
720 DISPLAY AT(8,1): " Old D
    istance?" :: ACCEPT AT(9,2)S
    IZE(4)VALIDATE(DIGIT):OD !036
730 DISPLAY AT(10,1): " New D
    istance?" :: ACCEPT AT(11,2)
    SIZE(4)VALIDATE(DIGIT):ND !1
    30
740 DISPLAY AT(8,1): "Did F-S
    top Change?(Y/N)" !086
750 CALL KEY(0,K,S):: IF S<1
    THEN 750 ELSE IF K=121 OR K
    =89 THEN 760 ELSE IF K=110 O
    R K=78 OR K=13 THEN 800 ELSE
    750 !066
760 DISPLAY AT(8,1): " Origin
    al F-Stop?" !007
770 ACCEPT AT(9,2)VALIDATE(N
    UMERIC)SIZE(4):FO !163
780 DISPLAY AT(10,2): "New F-
    Stop?" !001
790 ACCEPT AT(11,2)VALIDATE(
    NUMERIC)SIZE(4):FN !204
800 DT=(MN+SC/60)*TP/TN*(ND/
    OD)^2*(FN/FO)^2+.0084 !180
810 CALL HCHAR(6,1,32,264)::
    GOTO 490 !161
820 ! timer !196
830 DISPLAY AT(16,8):0 :: DI
    SPLAY AT(17,8):0 !167

```

(See Page 13)

EXTENDED BASIC—

(Continued from Page 12)

```

840 CALL TIMER !235
850 DISPLAY AT(24,1):"PRESS
FUNTION REDO TO REPEAT" !050
860 CALL KEY(0,K,S):: IF S<1
THEN 860 ELSE IF K=6 THEN 8
40 ELSE 310 !247
870 ! flash exposures !191
880 DISPLAY AT(6,2):"Guide #
? (Index ASA 25)" !148
890 DISPLAY AT(8,2):"ASA of
Film?" !231
900 DISPLAY AT(10,2):"Flash
To Subject Distance?" !185
910 CALL INFO(3,D())!098
920 FS=D(1)*SQR(D(2)/25)/D(3
)!023
930 DISPLAY AT(20,2):"Use F/
Stop ";INT(FS*100)/100 !176
940 CALL PAUSE :: GOTO 310 !
240
950 ! magnification !252
960 DISPLAY AT(5,1):"Distanc
e in Meters From Subject
to Center of Lens?" !156
970 DISPLAY AT(8,2):"Focal L
ength? (MM)" !237
980 CALL INFO(2,D())!097
990 G=D(2)/1000 :: X=G/(D(1)
-G)!198
1000 IF X>1E99 OR X<1E-8 THE
N XA$="NOT PHYSICALLY POSSIB
LE" ELSE XA$=STR$(X)!001
1010 DISPLAY AT(20,2):"Magni
fication=";XA$ !074
1020 CALL PAUSE :: GOTO 310
!240
1030 A=A+17 :: RETURN !061
1040 CALL PAUSE :: DISPLAY A
T(2,3)ERASE ALL:SEG$(A$,116,
18)!073
1050 ! metric conversions !0
00
1060 CALL MENU(H$,X)!130
1070 ON X GOTO 1080,1090,110
0,1110,310 !149
1080 CALL MENU(D$,X):: ON X
GOTO 1120,1160,1520,1560,310
!108
1090 CALL MENU(E$,X):: ON X
GOTO 1200,1240,1600,1640,310
!174
1100 CALL MENU(F$,X):: ON X
GOTO 1280,1320,1360,1400,310
!111
1110 CALL MENU(G$,X):: ON X
GOTO 1440,1480,310 !230
1120 DISPLAY AT(6,2):"Ounces
?" !219
1130 CALL INFO(1,D())!096
1140 DISPLAY AT(20,2):D(1);"
Ounces =" ;D(1)/.03527396;"Gr
ams" !198
1150 GOTO 1040 !099
1160 DISPLAY AT(6,2):"Grams?
" !103
1170 CALL INFO(1,D())!096
1180 DISPLAY AT(20,2):D(1);"
Grams =" ;D(1)*.03527396;"Oun
ces" !196
1190 GOTO 1040 !099
1200 DISPLAY AT(6,2):"Ounces
?" !219
1210 CALL INFO(1,D())!096
1220 DISPLAY AT(20,2):D(1);"
Ounces =" ;D(1)/.03381402;"Mi
liliters" !077
1230 GOTO 1040 !099
1240 DISPLAY AT(6,2):"Millil
iters" !189
1250 CALL INFO(1,D())!096
1260 DISPLAY AT(20,2):D(1);"
Milliliters =" ;D(1)*.0338140
2;"Ounces" !076
1270 GOTO 1040 !099
1280 DISPLAY AT(6,2):"Inches
?" !200
1290 CALL INFO(1,D())!096
1300 DISPLAY AT(20,2):D(1);"
Inches =" ;D(1)/.39370078;"Ce
ntimeters" !067
1310 GOTO 1040 !099
1320 DISPLAY AT(6,2):"Centim
eters?" !246
1330 CALL INFO(1,D())!096
1340 DISPLAY AT(20,2):D(1);"
Centimeters =" ;D(1)*.3937007
8;"Inches" !066
1350 GOTO 1040 !099
1360 DISPLAY AT(6,2):"Feet?"
!240
1370 CALL INFO(1,D())!096
1380 DISPLAY AT(20,2):D(1);"
Feet =" ;D(1)/3.2808399;"Mete
rs" !088
1390 GOTO 1040 !099
1400 DISPLAY AT(6,2):"Meters
?" !222
1410 CALL INFO(1,D())!096
1420 DISPLAY AT(20,2):D(1);"
Meters =" ;D(1)*3.2808399;"Fe
et" !087
1430 GOTO 1040 !099
1440 DISPLAY AT(6,2):"Degree
s F?" !150
1450 ACCEPT AT(7,3)SIZE(6)VA
LIDATE(NUMERIC)BEEP:D(1)!168
1460 DISPLAY AT(20,2):D(1);"
Degrees F =" ;5/9*(D(1)-32);"
Degrees C" !043
1470 GOTO 1040 !099
1480 DISPLAY AT(6,2):"Degree
s C?" !147
1490 ACCEPT AT(7,3)SIZE(6)VA
LIDATE(NUMERIC)BEEP:D(1)!168
1500 DISPLAY AT(20,2):D(1);"
Degrees C =" ;9/5*D(1)+32;"De
grees F" !189
1510 GOTO 1040 !099
1520 DISPLAY AT(6,2):"Pounds
?" !231
1530 CALL INFO(1,D())!096
1540 DISPLAY AT(20,2):D(1);"
Pounds =" ;D(1)/2.204622;"Kil
ograms" !066
1550 GOTO 1040 !099
1560 DISPLAY AT(6,2):"Kilogr
ams?" !026
1570 CALL INFO(1,D())!096
1580 DISPLAY AT(20,2):D(1);"
Kilograms =" ;D(1)*2.204622;"
Pounds" !065
1590 GOTO 1040 !099
1600 DISPLAY AT(6,2):"Gallon
s?" !063
1610 CALL INFO(1,D())!096
1620 DISPLAY AT(20,2):D(1);"
Gallons =" ;D(1)/.264172;"Lit
ers" !052
1630 GOTO 1040 !099
1640 DISPLAY AT(6,2):"Liters
?" !225
1650 CALL INFO(1,D())!096
1660 DISPLAY AT(20,2):D(1);"
Liters =" ;D(1)*.264172;"Gall
ons" !051
1670 GOTO 1040 !099
1680 STOP !152
27855 SUB TIMER !239
27860 ! Displays and counts
down timer; JLS 91 !226
27865 CALL CHAR(58,"26292929
292929262222222222222222721
(See Page 13)

```

EXTENDED BASIC—

(Continued from Page 13)

```

212127242427")!shapes for 10
,11,12 !131
27870 CALL GCHAR(24,3,L):: I
F L=80 THEN DISPLAY AT(24,1)
: :: GOTO 27895 !209
27875 FOR L=-2 TO 9 :: L2=L*
PI/6 :: CALL SPRITE(#L+3,51+
L,7,SIN(L2)*60+66,COS(L2)*60
+138):: NEXT L !145
27880 DISPLAY AT(20,1):"PRES
S THE          SPAC
E BAR TO STOP THE TIMER,PRES
S ENTER TO RESTART, AND FUNC
TION AID TO CANCEL." !130
27885 DISPLAY AT(16,1)SIZE(7
):"Minutes" !157
27890 DISPLAY AT(17,1)SIZE(7
):"Seconds" !136
27895 ACCEPT AT(16,9)VALIDAT
E(DIGIT)SIZE(-4)BEEP:MN :: M
N=INT(MN)!066
27900 ACCEPT AT(17,9)VALIDAT
E(DIGIT)SIZE(-4)BEEP:SC :: S
C=INT(SC)!052
27905 IF MN>200 OR SC>200 TH
EN 27895 !133
27910 CALL SPRITE(#20,115,10
,SIN((SC-15)/9.645)*45+66,CO
S((SC-15)/9.645)*45+138)!205
27915 CALL SPRITE(#21,109,10
,SIN((MN-15)/9.645)*30+66,CO
S((MN-15)/9.645)*30+138)!207
27920 FOR M=MN TO 0 STEP -1
!074
27925 IF MN=M THEN L=SC ELSE
L=59 !061
27930 FOR S=L TO 0 STEP -1 :
: CALL LOCATE(#20,SIN((S-15)
/9.645)*45+66,COS((S-15)/9.6
45)*45+138)!184
27935 CALL LOCATE(#21,SIN((M
-15)/9.645)*30+66,COS((M-15)
/9.645)*30+138)!030
27940 IF S=30 OR S=0 THEN CA
LL SOUND(100,220,3):: GOTO 2
7950 !031
27945 CALL SOUND(100,130,7)!
129
27950 DISPLAY AT(18,2):M;S !
233
27955 CALL SOUND(178,130,30)
!189
27960 FOR L=1 TO 10 :: CALL
KEY(0,K,X):: IF X AND K=32 T
HEN 27995 ELSE IF X AND K=1
THEN 28005 !166
27965 NEXT L !226
27970 NEXT S !233
27975 NEXT M !227
27980 DISPLAY AT(18,2):0;0 !
059
27985 CALL SOUND(1000,-3,0)!
010
27990 GOTO 28005 !033
27995 DISPLAY AT(12,1):"STOP
" !159
28000 CALL KEY(0,K,X):: IF X
AND K=13 THEN DISPLAY AT(12
,1): :: GOTO 27970 ELSE 2800
0 !229
28005 SUBEND !168
29185 SUB BACKDROP(X)!124
29190 ! RESETS CHARACTERS AN
D SCREEN TO COLOR FROM 1 TO
16 /JLS 9/89 !206
29195 ! 1 BLANKS SCREEN WITH
CURRENT BACKGROUND COLOR !2
05
29200 IF X=1 THEN Y=1 :: GOT
O 29215 !183
29205 X=X-1 :: ON X GOSUB 29
220,29225,29225,29230,29225,
29225,29225,29225,29225,2922
5,29225,29225,29225,29225,29
225 !204
29210 CALL SCREEN(X+1)!171
29215 FOR L=0 TO 14 :: CALL
COLOR(L,Y,1):: NEXT L :: SUB
EXIT !217
29220 Y=9 :: RETURN !035
29225 Y=2 :: RETURN !028
29230 Y=16 :: RETURN !082
29235 Y=15 :: RETURN !081
29240 SUBEND !168
30595 SUB MENU(A$,X)!127
30600 ! A$ IS LIST OF OPTION
S, EACH N CHARACTERS LONG, V
.2; JLS 5/90 !111
30605 ! X : RETURN VARIABLE
FOR NUMBER OF CHOICE !043
30607 CALL DELSPRITE(ALL)!11
5
30610 N=23 :: FOR L=1 TO LEN
(A$)/N+.9 !169
30615 DISPLAY AT(4+L,1):L;SE
G$(A$, (L-1)*N+1,N)!010
30620 NEXT L !226
30625 IF SEG$(A$,LEN(A$)-3,4
)="QUIT" THEN L=L-1 :: GOTO
30635 !119
30630 DISPLAY AT(4+L,1):L;"M
AIN MENU" !181
30635 DISPLAY AT(23,3):"CHOI
CE?" !074
30640 CALL SOUND(200,-1,4)!2
20
30645 CALL KEY(0,X,S):: IF S
<1 OR X>L+48 OR X<49 THEN 30
645 ELSE X=X-48 !131
30650 DISPLAY AT(2,3)ERASE A
LL:SEG$(A$, (X-1)*N+1,N)!228
30655 SUBEND !168
30785 SUB INFO(X,D())!194
30790 ! X : NUMBER OF INPUTS
TO PROMPT FOR !194
30795 ! D() : ARRAY TO PUT A
NSWERS INTO !170
30800 FOR L=1 TO X !153
30805 ACCEPT AT(5+L*2,3)SIZE
(6)VALIDATE(NUMERIC)BEEP:D(L
)!195
30810 NEXT L !226
30815 SUBEND !168
30820 SUB PAUSE !236
30825 FOR D=1 TO 100 :: NEXT
D !241
30830 DISPLAY AT(24,2):"PRE( )
S ANY KEY TO CONTINUE" !088
30835 CALL KEY(0,K,S):: IF S
<1 THEN 30835 !049
30840 SUBEND !168

```

READER TO READER

Norberto R. Bettinelli, Casilla de Correo 39, 1429 Buenos Aires, Argentina, writes, "I own a monochrome Samsung MA 2565 amber monitor. I connect it to the AT I own with the cable which comes with it (an inversed 'TI joystick' plug, to describe it). How should a cable be properly wired to use this monitor to my Geneve?"

Bettinelli also writes, "I understand PC modems are identical to TI99/4A and Geneve ones except that in some part of their wiring out of four wires two of them must be crossed. Could somebody tell me which? I don't think a little experimenting might produce much damage."

Reader to Reader is a column to put TI99/4A and Geneve 9640 users in contact with other users. Be sure to address your questions to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

Bad Weather Golf

A place to play even when it's raining

By JAMES B. SMITH
©1991 J.B. Smith

On those days when you'd just love to be out on the fairways, but the weather refuses to cooperate, put this program in your TI99/4A, and you and your golf buddies can still enjoy your round.

This is an 18-hole, par 72 course, for one to four players. When typing in the names of the players, use no more than four letters for each.

Next is the choice of level: 1 or 2. In level two, the holes are smaller, so putting must be somewhat more accurate, and shots, with each club, are slightly shorter. The clubs used are: 1 through 4 in woods, 1 through 9 in irons, plus a wedge and a putter. Obstacles include trees, water hazards and sand traps. If a ball comes too close to the edge of the monitor screen, it is considered to be out-of-bounds, with a two-stroke penalty. (This is generally a problem only when shooting to the greens, where discretion must be used in choosing a club.) A ball ending in a water hazard results in a one stroke penalty. The only wood which can cause the ball to cross an obstacle is the four wood. The only irons that can be used to cross an obstacle are the 7, 8, 9 and wedge. The wedge is used only in coming out of a trap, as its direction and distance are undependable.

At the beginning of each hole the first player's ball is placed in a random location on the tee. Subsequent players will have their balls placed near this spot. Each player, in turn, plays the complete hole. The hole placement on each green is also done randomly from round to round.

In making a shot, a player is first asked what direction he wants the ball to travel. A number from 0 through 39 must be the response, with 0 indicating a shot traveling directly to the screen's right. Successive numbers proceed clockwise from there.

Next, a player must indicate his club choice. To select a No. 1 wood, for example, you would enter 1w. To select an iron you would simply enter the iron number. To select the wedge, you would enter "w." The putter is selected with the letter "p."

When a nine iron, putter or wedge is used, the player must also enter the power

of the stroke. With the nine iron, the choice is either half or full swing. The power range for the wedge and putter is 1-8.

The driver (1w) can be used only from the tee, and a wedge must be used in a sand trap. When crossing an obstacle, bear in mind that the ball needs to lie a certain minimum distance from the obstacle for the shot to work. The distance achieved with any club will vary from one shot to another. Also by random selection, a player can at times "dub" the ball, and both direction and distance will be terrible.

The computer will display each player's score and what par is at that point. The random selection of ball placement on the tee, and hole placement on each green, is done to make the game more interesting. Also, choosing the same direction and club as the player who precedes you has its risks, especially from the tee. Because ball placement isn't the same, shot distance may not be the same.

As written, the game requires a speech synthesizer and runs out of Extended BASIC. If you do not have a synthesizer, don't bother to input the CALL SAY statements when entering the program.

Good luck!

Bad Weather Golf

```

100 REM *****
!002
110 REM * BAD WEATHER GOLF *
!141
120 REM *****
!002
125 REM COPYRIGHT (C) 1986 !
031
130 REM JAMES B. SMITH !095
140 REM RICE, MINNESOTA !215
150 REM **BALL** !125
160 CALL CHAR(116,"00000000
00000010100000000000000000
000000000808")!068
170 CALL CLEAR :: CALL SCREE
N(4):: CALL MAGNIFY(2)!073
180 FOR L=0 TO 8 :: CALL COL
OR(L,5,4):: NEXT L !042
190 REM **TITLE** !228
200 CALL CHAR(128,"FFFF0000
000000003030303030303030C0C0

```

```

0C0C0C0C0C00000000000000FFFF"
)!116
210 CALL CHAR(132,"C0E070381
C0E070303070E1C3870E0C0FFFF0
30303030303")!067
220 CALL HCHAR(5,6,133):: CA
LL HCHAR(5,7,128,21):: CALL
HCHAR(5,28,132)!035
230 CALL VCHAR(6,6,130,14)::
CALL VCHAR(6,28,129,14):: C
ALL HCHAR(20,6,132):: CALL H
CHAR(20,7,131,21)!225
240 CALL HCHAR(20,28,133)!10
1
250 RESTORE 2210 !007
260 DISPLAY AT(23,10):"BY JA
MES B. SMITH" :: DISPLAY AT(
7,13):"B A D";:: DISPLAY AT(
9,9):"W E A T H E R";:: CALL
COLOR(13,7,4)!069
270 FOR X=12 TO 16 :: FOR Y=
9 TO 25 :: READ Z :: CALL HC
HAR(X,Y,Z)!093
280 NEXT Y :: NEXT X !095
290 FOR D=1 TO 500 :: NEXT D
!245
300 CALL CHARSET :: CALL CLE
AR !201
310 RESTORE 1580 !143
320 REM **TREE** !146
330 CALL CHAR(112,"071F3F7F7
FFFFFF7F3F12010101010307E0F8F
CFEFEFFFF7FFE4C808080C0C0E0"
)!217
340 REM **GREEN & TEE** !023
350 CALL CHAR(104,"FFFFFFFF
FFFFFFFF")!062
360 REM **FAIRWAY** !117
370 CALL CHAR(96,"FFFFFFFFFF
FFFFFF")!023
380 REM **HOLE** !138
390 CALL CHAR(108,"00000000
0000001010100000000000000000
00000000C0C0C0")!002
400 REM **WATER** !229
410 CALL CHAR(136,"070F1F1F1
F0F0F030703030301010100C0E0F
0F8F8FCFCF8F0F0F0F8F8F8F0E0"
)!104
420 REM **SAND** !136
430 CALL CHAR(132,"001F3F7F7

```

(See Page 16)

BAD WEATHER GOLF—

(Continued from Page 15)

```

F7F3F1F0F0707070303030100008
0C0E0F0F0F8F8FCFCF8F8F8F0C0"
)!104
440 REM **BALL** !125
450 CALL CHAR(120,"000000000
0000001010000000000000000000
0000000008080000000000000000"
)!030
460 CALL DELSPRITE(ALL):: CA
LL CLEAR !198
470 DISPLAY AT(12,1)BEEP:"#
OF PLAYERS?" :: ACCEPT AT(12
,17)VALIDATE("1234"):HM !134
480 IF HM=1 THEN 500 :: IF H
M>4 THEN 470 !231
490 FOR L=1 TO HM :: DISPLAY
AT(12,1)BEEP:"NAME OF PLAYE
R #";STR$(L);"?" :: ACCEPT A
T(12,20)SIZE(6):PL$(L):: NEX
T L :: GOTO 510 !252
500 DISPLAY AT(12,1)BEEP:"YO
UR NAME?" :: ACCEPT AT(12,12
):PL$(1)!136
510 CALL CLEAR :: CALL MAGNI
FY(3):: CALL COLOR(9,4,4,10,
3,3,14,5,4)!236
520 DISPLAY AT(12,5)BEEP:"LE
VEL? 1 EASY":TAB(12);"2 HARD
" :: ACCEPT AT(12,18)SIZE(1)
VALIDATE("12"):LE !176
530 PRINT " INSTRUCTION
S": " WHEN QUESTION "DIREC
TION?" IS ASKED, CHOICES AR
E 0 THRU39 COUNTED ";!055
540 PRINT "CLOCKWISE,";" WIT
H": "0 BEING HORIZONTALLY TO"
:"THE RIGHT.": " CLUB CHOIC
ES ARE 1W,2W,3W, 4W,2,3,4,5,
6,7,8,9+W&P." !002
550 PRINT : " CLUBS WHICH CAN
CROSS": "OBSTACLES ARE 4W,7,
8,9 & W. (4W MUST BE MIN. DI
ST. FROM OBST.)" !164
560 PRINT : " SAND TRAP SHOTS
MUST BE": "PLAYED WITH A WED
GE, ""W""." :: " G O O D L
U C K!" !094
570 PRINT : "READY? PRESS K
EY" !071
580 CALL KEY(0,KE,STA):: IF
STA=0 THEN 580 !249
590 ROUND=1 !064
600 REM **SET UP COURSE** !0
04
610 CALL DELSPRITE(ALL):: CA
LL CLEAR !198
620 FOR L=4 TO 23 :: CALL HC
HAR(L,2,96,30):: NEXT L !092
630 READ PAR,YD !202
640 PAR1=PAR1+PAR !138
650 FOR TREE=13 TO 22 :: REA
D R,C :: CALL SPRITE(#TREE,1
12,3,R,C):: NEXT TREE !074
660 FOR L=11 TO 12 :: READ R
,C :: CALL SPRITE(#L,136,5,R
,C):: NEXT L !163
670 FOR SAN=7 TO 8 :: READ R
,C :: CALL SPRITE(#SAN,132,1
2,R,C):: NEXT SAN !056
680 READ R,C :: FOR GREEN=1
TO 4 :: CALL HCHAR(R+GREEN,C
,104,4):: NEXT GREEN !073
690 RANDOMIZE !149
700 AD=(RND*15)-7 !060
710 ADH=(RND*19)-9 !138
720 READ R,C :: R=R-AD :: C=
C-ADH :: CALL SPRITE(#6,108,
2,R,C)!HOLE !247
730 READ TEE,TE1 !242
740 CALL HCHAR(TEE,TE1,104,3
):: CALL HCHAR(TEE+1,TE1,104
,3)!241
750 DISPLAY AT(1,2):"SCORE:"
!223
760 READ RZ,CZ !147
770 RZ=RZ+AD :: CZ=CZ+ADH !1
00
780 DISPLAY AT(23,15)SIZE(7)
:"YDS";YD :: DISPLAY AT(24,3
)SIZE(8):"HOLE #";STR$(ROUND
):: DISPLAY AT(24,12):"** PA
R";PAR;"**" !037
790 FOR TURN=1 TO HM !211
800 DIR=0 !150
810 IF HM=1 THEN 820 ELSE DI
SPLAY AT(3,2):PL$(TURN);"S"
;" TURN" !182
820 CALL SPRITE(#4,120,16,RZ
,CZ)!BALL !235
830 IF HM=1 THEN DISPLAY AT(
1,9):PL$(1);ST(1):: GOTO 850
!243
840 DISPLAY AT(1,9):PL$(1);S
T(1);TAB(20);PL$(2);ST(2):TA
B(9);PL$(3);ST(3);TAB(20);PL
$(4);ST(4)!225
850 DIS=0 !151
860 DISPLAY AT(3,15):"DIRECT
ION?" :: ACCEPT AT(3,26)S
(2)VALIDATE(DIGIT)BEEP:DIR !
209
870 IF DIR>39 THEN 860 !049
880 CALL HCHAR(3,15,32,16)!2
26
890 DISPLAY AT(3,15):"CLUB?"
:: ACCEPT AT(3,26)SIZE(2)VA
LIDATE("W123456789P")BEEP:CL
$ !146
900 CALL HCHAR(3,15,32,16)!2
26
910 IF SAT=1 AND CL$<>"W" TH
EN 890 !038
920 IF (CL$="1W")*(STR(TURN)
>0)THEN 890 !065
930 STR(TURN)=1 !103
940 IF CL$="W" THEN 1160 !02
5
950 IF CL$="P" THEN 1180 !03
8
960 DIS=(32-INT(VAL(SEG$(CL$
,1,1))*1.6))-INT(LE*1.5):: I
F SEG$(CL$,2,1)="W" THEN DIS
=DIS+3 !198
970 RANDOMIZE :: RA=RND ::
IF RA>.90 THEN DIS=DIS+DIS/7
:: GOTO 990 !063
980 IF RA>.82 THEN DIS=DIS+D
IS/10 !248
990 IF RA<.16 AND RA>.04 THE
N DIS=DIS-DIS/9 :: GOTO 1010
!253
1000 IF RA<.28 THEN DIS=DIS-
DIS/12 !250
1010 IF CL$="P" THEN 1040 !1
54
1020 IF CL$="9" THEN DISPLAY
AT(3,15):"FULL SWING?" :: A
CCEPT AT(3,27)SIZE(1)VALIDAT
E("YN")BEEP:ANS$ :: IF ANS$=
"N" THEN DIS=DIS/1.5 !145
1030 IF RA<.04 THEN DIS=DIS/
2 :: DIR=DIR-3 :: CALL SAY("
UHOH. NOT THAT")!185
1040 GOTO 2150 !189
1050 IF CL$="4W" THEN GOTO 2
130 !162
1060 IF CL$="7" OR CL$="8" O
R CL$="9" OR CL$="W" THEN GO
TO 2120 !228
1070 CALL MOTION(#4,R,C)::
T(TURN)=ST(TURN)+1 :: SAT=0
:: FOR Z=1 TO DIS :: CALL CO
(See Page 17)

```


BAD WEATHER GOLF—

(Continued from Page 16)

```

INC(ALL,Y):: IF Y=-1 THEN 12
80 !062
1080 CALL POSITION(#4,R1,C1)
:: IF R1<17 OR R1>175 THEN 1
220 !198
1090 CALL COINC(ALL,Y):: IF
Y=-1 THEN 1280 !146
1100 IF C1<5 OR C1>237 THEN
1220 !075
1110 NEXT Z :: CALL MOTION(#
4,0,0)!114
1120 CALL COINC(#4,#6,LE,Y):
: IF Y=-1 THEN 1280 !147
1130 CALL POSITION(#4,R1,C1)
:: IF R1<17 OR R1>175 THEN 1
220 !198
1140 IF C1<5 OR C1>237 THEN
1220 !075
1150 GOTO 830 !144
1160 DIS=INT(RND*6)+3 :: IF
DIS>6 THEN DIR=DIR+2 !189
1170 IF DIS<5 THEN DIR=DIR-2
!010
1180 DISPLAY AT(3,15):"POWER
?" :: DISPLAY AT(2,15):"(1-8
)" :: ACCEPT AT(3,26)SIZE(1)
VALIDATE("12345678")BEEP:PO
!201
1190 CALL HCHAR(2,15,32,7)::
DIS=DIS+PO :: IF CL$="P" TH
EN DIS=PO*1.6 :: GOTO 1010 !
117
1200 GOTO 970 !028
1210 REM BALL OFF SCREEN !17
6
1220 CALL SOUND(1000,110,0,5
00,0):: CALL MOTION(#4,0,0):
: IF C1>237 OR C1<5 THEN 125
0 !213
1230 IF R1>175 THEN CALL LOC
ATE(#4,174,C1)ELSE CALL LOCA
TE(#4,18,C1)!194
1240 ST(TURN)=ST(TURN)+2 ::
CALL SAY("UHOH"):: GOTO 830
!137
1250 IF C1>237 THEN CALL LOC
ATE(#4,R1,236)ELSE CALL LOCA
TE(#4,R1,6)!155
1260 ST(TURN)=ST(TURN)+2 ::
GOTO 830 !070
1270 REM **BALL HIT OBJECT**
!089
1280 CALL MOTION(#4,0,0):: C
ALL COINC(#4,#6,10,HIT):: IF
HIT=-1 THEN 1400 !BALL IN H
OLE !220
1290 CALL COINC(#4,#7,10,TR)
:: IF TR=-1 THEN SAT=1 :: CA
LL SOUND(-100,220,2):: CALL
SAY("UHOH"):: GOTO 830 !175
1300 CALL COINC(#4,#8,10,TR1)
:: IF TR1=-1 THEN SAT=1 ::
CALL SOUND(-100,220,2):: CAL
L SAY("UHOH"):: GOTO 830 !01
8
1310 CALL COINC(#4,#11,10,W1)
:: CALL COINC(#4,#12,10,W2)
:: IF W1=-1 OR W2=-1 THEN 13
70 !BALL IN WATER !125
1320 REM **BALL HIT TREE** !
210
1330 CALL SOUND(300,200,0,22
0,0):: CALL SAY("UHOH")!123
1340 CALL MOTION(#4,-R,-C)::
FOR D=1 TO 40 :: NEXT D ::
CALL MOTION(#4,0,0)!238
1350 CALL COINC(ALL,Y):: IF
Y=-1 THEN 1340 ELSE 830 !089
1360 REM **BALL IN WATER** !
215
1370 FOR SOUND=110 TO 440 ST
EP 110 :: CALL SOUND(-100,SO
UND,3):: NEXT SOUND !2231380
ST(TURN)=ST(TURN)+1 :: CALL
SAY("UHOH"):: GOTO 1340 !13
6
1390 REM **BALL IN HOLE** !1
24
1400 CALL DELSPRITE(#4):: FO
R LP=400 TO 600 STEP 50 :: C
ALL SOUND(-100,LP,0):: NEXT
LP !234
1410 IF CL$<>"P" THEN CALL S
AY("GOOD WORK")!156
1420 STR(TURN)=0 !102
1430 NEXT TURN !223
1440 PL$(HM+1)=PL$(1):: ST(H
M+1)=ST(1):: FOR L=2 TO HM+2
:: PL$(L-1)=PL$(L):: ST(L-1
)=ST(L):: NEXT L !055
1450 FOR DELAY=1 TO 100 :: N
EXT DELAY !071
1460 ROUND=ROUND+1 !137
1470 CALL CLEAR :: CALL DELS
PRITE(ALL)!198
1480 DISPLAY AT(22,19):"PAR
=";PAR1 :: FOR DELAY=1 TO 25
0 :: NEXT DELAY !108
1490 IF ROUND<19 THEN 610 !2
20
1500 FOR L=1 TO HM :: DISPLA
Y AT((L*2)+8,1):PL$(L);"'S F
INAL SCORE =" ;ST(L):: NEXT L
!107
1510 PAR1=0 :: CALL HCHAR(1,
2,32,27):: CALL HCHAR(3,2,32
,29)!045
1520 FOR D=1 TO 300 :: NEXT
D :: DISPLAY AT(2,1)BEEP:"TI
ME FOR ANOTHER?(Y/N)" :: ACC
EPT AT(2,25)VALIDATE("YN"):A
NS$ !097
1530 IF ANS$="N" THEN 1560 E
LSE ST(1),ST(2),ST(3),ST(4)=
0 :: CALL SAY("GOOD")!188
1540 RESTORE 1590 :: DISPLAY
AT(23,1)BEEP:"SAME PLAYER(S
)?" !101
1550 ACCEPT AT(23,17)VALIDAT
E("YN"):ANS$ :: IF ANS$="Y"
THEN 510 ELSE 460 !037
1560 CALL SAY("SO LONG THEN"
):: END !227
1570 REM **ORDER OF DATA=PAR
,YD,TREES,WATER,SAND,GREEN,H
OLE,TEE,BALL** !168
1580 REM **HOLE #1** !254
1590 DATA 4,463,126,45,106,7
8,88,110,148,116,44,188,95,2
26,95,185,126,128,102,156,78
,142 !065
1600 DATA 82,206,67,176,79,1
92,32,219,6,27,56,216,20,12,
152,92 !058
1610 REM **HOLE #2** !255
1620 DATA 4,469,56,124,44,14
8,98,50,92,144,106,122,148,8
8,78,74,128,102,84,175,82,20
6 !172
1630 DATA 42,176,76,112,62,1
76,76,154,5,26,48,208,20,8,1
52,64 !005
1640 REM **HOLE #3** !000
1650 DATA 3,258,32,106,64,88
,80,78,80,132,99,74,106,120,
148,124,126,128,119,70,80,17
2 !152
1660 DATA 75,150,38,126,64,1
24,32,175,5,19,48,152,20,12,
152,96 !045
1670 REM **HOLE #4** !001
1680 DATA 5,532,45,76,48,96,

```

(See Page 18)

BAD WEATHER GOLF—

(Continued from Page 17)

```

150,161,55,27,90,78,89,116,9
6,145,114,158,132,163,109,38
!123
1690 DATA 90,48,106,20,50,45
,73,63,9,3,80,26,20,27,152,2
15 !087
1700 REM **HOLE #5** !002
1710 DATA 4,447,32,184,62,20
0,64,136,72,104,88,174,96,76
,104,184,124,168,144,64,144,
160 !254
1720 DATA 134,88,160,119,138
,114,92,152,19,11,164,88,5,2
7,32,215 !152
1730 REM **HOLE #6** !003
1740 DATA 4,473,48,182,84,62
,72,166,88,224,104,32,112,72
,112,184,128,104,132,158,161
,120 !029
1750 DATA 104,138,141,58,144
,132,163,60,18,4,152,32,7,28
,48,224 !088
1760 REM **HOLE #7** !004
1770 DATA 5,528,132,58,108,6
5,85,74,76,108,74,139,84,198
,38,120,38,82,40,170,154,52
!069
1780 DATA 68,192,44,194,56,7
2,62,152,6,27,56,216,21,3,16
0,24 !205
1790 REM **HOLE #8** !005
1800 DATA 5,592,34,190,121,4
9,54,193,76,190,103,179,126,
152,132,16,139,96,169,108,15
2,174 !108
1810 DATA 146,48,168,48,135,
34,122,206,19,3,160,24,5,27,
32,216 !042
1820 REM **HOLE #9** !006
1830 DATA 4,445,40,82,80,66,
120,64,104,176,112,80,94,90,
128,48,136,32,144,16,128,216
!086
1840 DATA 64,116,75,82,52,67
,72,18,7,5,64,40,21,27,160,2
16 !101
1850 REM **HOLE #10** !046
1860 DATA 4,376,38,125,50,46
,153,94,132,88,112,82,92,70,
38,63,104,21,99,41,72,105 !2
00
1870 DATA 64,74,82,52,48,30,
78,92,8,3,74,25,20,15,152,12

```

```

0 !047
1880 REM **HOLE #11** !047
1890 DATA 4,430,68,50,69,77,
73,99,82,122,121,170,123,47,
123,75,118,112,61,183,135,18
6 !150
1900 DATA 83,183,108,178,91,
152,81,228,11,26,94,208,13,2
,96,16 !057
1910 REM **HOLE 12** !013
1920 DATA 4,376,32,196,89,11
9,144,98,130,112,119,131,108
,147,94,99,84,137,74,155,65,
137 !024
1930 DATA 65,117,41,155,33,1
68,67,169,4,16,37,128,21,14,
160,112 !095
1940 REM **HOLE 13** !014
1950 DATA 3,254,158,82,148,9
4,137,75,107,88,92,138,63,12
2,50,106,128,92,126,110,62,4
8 !157
1960 DATA 57,60,38,87,74,108
,69,81,3,8,32,66,21,14,161,1
12 !105
1970 REM **HOLE 14** !015
1980 DATA 5,499,132,28,128,4
9,120,69,112,98,100,131,85,1
60,144,102,120,198,68,222,77
,189 !052
1990 DATA 46,187,67,198,110,
165,90,215,4,27,42,216,20,4,
152,32 !044
2000 REM **HOLE 15** !016
2010 DATA 3,243,29,30,41,44,
57,59,80,76,99,84,45,99,62,1
08,129,100,138,144,109,129 !
013
2020 DATA 82,116,145,96,102,
102,129,125,18,15,152,120,4,
8,24,64 !081
2030 REM **HOLE 16** !017
2040 DATA 4,472,157,74,142,9
0,127,112,112,136,92,152,85,
174,71,185,87,193,99,208,28,
202 !007
2050 DATA 34,180,57,193,48,1
65,71,160,7,27,68,216,21,6,1
60,48 !007
2060 REM **HOLE 17** !018
2070 DATA 3,263,72,59,37,73,
48,88,65,104,89,120,102,145,
57,20,65,40,85,75,96,85 !122
2080 DATA 110,100,112,125,12
6,97,128,122,18,15,154,120,4

```

```

,4,24,32 !110
2090 REM **HOLE 18** !019
2100 DATA 4,418,47,177,56,16
4,69,149,81,134,96,118,109,1
01,126,87,143,79,41,98,73,54
!132
2110 DATA 119,43,124,69,96,6
2,140,55,19,4,160,32,4,20,24
,160 !190
2120 CALL MOTION(#4,R,C):: F
OR Z=1 TO DIS*15 :: NEXT Z :
: DIS=DIS/6 :: GOTO 1070 !12
7
2130 CALL MOTION(#4,R,C):: F
OR Z=1 TO DIS/1.2 :: CALL CO
INC(ALL,Y):: IF Y=-1 THEN ST
(TURN)=ST(TURN)+1 :: GOTO 12
80 !195
2140 NEXT Z :: FOR Z=1 TO 36
0 :: NEXT Z :: DIS=DIS/8 ::
GOTO 1070 !095
2150 IF DIR<6 THEN C=5 :: R=
DIR !065
2160 IF DIR>35 THEN C=5 :: R
=-5+(DIR-35)!087
2170 IF DIR>5 AND DIR<16 THE
N R=5 :: C=5-(DIR-5)!184
2180 IF DIR>15 AND DIR<26 TH
EN C=-5 :: R=5-(DIR-15)!223
2190 IF DIR>25 AND DIR<36 TH
EN R=-5 :: C=-5+(DIR-25)!163
2200 GOTO 1050 !109
2210 DATA 133,128,128,132,32
,133,128,128,132,129,32,32,3
2,129,128,128,128 !157
2220 DATA 130,32,32,129,32,1
30,32,32,129,129,32,32,32,12
9,32,32,32 !034
2230 DATA 130,32,32,32,32,13
0,32,32,129,129,32,32,32,129
,131,131,32 !076
2240 DATA 130,32,32,134,32,1
30,32,32,129,129,32,32,32,12
9,32,32,32 !030
2250 DATA 132,131,131,133,32
,132,131,131,133,129,131,131
,131,129,32,32,32 !115

```



Attend
a
TI Fair

Hardware demos highlight Lima fair

Hardware developments are featured in videotapes of the proceedings of the Lima Multi User Group Conference held May 18.

The tape presents Gary Bowser's demo of TIM (TI Image Maker), Don O'Neil and Bud Mills' discussion of an accelerator for the 99/4A based on the 99105 CPU chip and an interview with Mike Maksimik regarding his MIDI interface for the 99/4A and Geneve and his other plans.

As well, software and programming demos held throughout the day are shown on the tape, along with meetings of user group representatives.

The Lima User Group will make copies of the set of three videotapes available to any user group and to individuals who are paid members of the Lima Users Group at minimal cost. Tapes can be obtained by sending a check for \$15 (\$18 U.S. if the destination is Canada), or by sending three blank VHS tapes and a check for \$3.75 to Charles Good, Box 647, Venedocia OH 45894. Good is newsletter editor and librarian for the Lima User Group.

TIM (see review, page 33) is an 80-column upgrade that fits inside the console. According to Bowser, future peripherals will be easy to add and digitizing is in the works. He says he received rights to TI's operating system and has rewritten its source code.

Bowser says his manual offers step-by-step procedures. He says that his company also offers free installation of the device, but the customer must pay shipping for the console and TIM.

He notes that the device works in other systems, such as Coleco/Adam, Tomy Tutor, Apple II, some laptops and Spectrum Video.

Bowser also discussed his RAMBO development package, the Extended BASIC cartridge he is producing for the RICH GKXB (see Newsbytes, page 35), a projected 9938/58 developer package and a speech package under development which will "give you mind-bogglingly better speech."

The accelerator harnessing the power of the 99105 chip was not available for demo at the fair. However, it reportedly will run a 4A at about 12 megahertz and is designed to be the first of a set of "building block steps" in a modular approach to hardware upgrades.

Maksimik said he is thinking of releasing an upgraded EPROM with the RS232 for MIDI interfaces as well as some mouse-specific programs. Possible upgrades to his MIDI interface include a graphics interface to the screen. He is working on v3.0 to the MIDI interface (see May 1991 MICROpendium) but says that will not be the final version. He notes that the MIDI interface is "absolutely compatible" with all RS232 cards.

He notes that the Chicago Users Group bulletin board supports MIDI Master 99. The board is available at up to 2400 baud at (708) 862-0182, 8N1.

Irwin Hott, sysop of the Central Ohio Ninety-Niners, reported on progress on setting up a clearinghouse bulletin board for user group newsletter articles. He says currently the group is trying to decide about what to do about a hard and floppy disk controller for the board. He has been able to upgrade the software for a 2400 baud modem and suggested that "a 2400 baud modem at both ends makes it really fast." User group representatives discussed

access, possible time limits and other criteria for the board.

A MUG "conference" discussed current issues among users' groups. Charles Good of Lima noted that internal politics at the Ohio State University Lima campus may make the 1991 conference the last by his group. He noted that the Lima Users Group is a student group with community members. The group is so small that if it had to charge attendees and vendors and enforce payment, it could not hold the conference, he says.

Problems discussed by users group representatives include membership, participation and the need to provide payment to software authors to insure continued production of software for the TI99/4A.

Hal Shanafield of the Chicago TI Users' Group says the group has a number of foreign members who attend the fair in Chicago each year. He says that this year he is getting together a group to reciprocate by attending the TI Treffen in Berlin in September. For information, contact the Chicago TI Users' Group, P.O. Box 578341, Chicago, IL 60657.

Also on the tape are:

- Demo of software from MS Express Mike Sealy, Micky Schmitt and Norm Rokke.
- Eunice Spooner, school volunteer, and Chris Bedard, student, on the Oakland Computer Club in Maine, a TI computer club

(See Page 35)

| HORIZON COMPUTER | |
|---|---|
| HORIZON BARE BOARD, Manual + ROS8.14 \$45 | |
| Zero K Kit=ALL parts, less Memory \$105 | |
| 128k Memory chips \$45 each, 32k chips \$8 | |
| 128k Kit=\$150 or \$180 Built | RAMDISK |
| 256k Kit=\$195 \$225 Built | |
| 384k Kit=\$240 \$270 Built | |
| 512k Kit = \$385 \$415 Built | |
| One Meg Kit=\$465 \$495 Built | |
| 1.5 Meg Kit=\$645 \$675 Built | |
| ADD A RAMBO Mod for \$45 | |
| 256/800 PHOENIX Kit=\$495 or \$525 Built | |
| P-GRAM kit 72k = \$150 or \$180 Built | |
| P-GRAM+ kit 192k= \$230 \$260 Built | |
| CLOCK for P-GRAM's =\$20 | |
| KITS Include ALL PARTS Needed | |
| MEMory EXpansion for the GENEVE 9640 | |
| MEMEX 504k \$245 | GENMOD allows the 9640 to address all 2 MEG on the MEMEX card at ZERO wait |
| MEMEX 504k+GENMOD \$345 | |
| MEMEX 1008k+GENMOD \$395 | |
| MEMEX 1512k+GENMOD \$445 | |
| MEMEX 2016k+GENMOD \$495 | |
| The GENMOD is ADDED to YOUR GENEVE 9640 card. | |
| Up old 180k to 256k w/instructions=\$40 | |
| 32/16 Console Mem Mod w/Supercart =\$40 | |
| Ohio Residents add 6% sales tax | |
| Ship OverSeas ADD \$7 Surface or \$10 AIR | |
| Prices may change if MEMORY costs go up | |
| Shipping FREE Within U.S. and Canada | |
| AmEX + MasterCard + Visa ADD %10 | |
| Call 419-385-5946 or Send your order to | |
| Bud Mills Services | |
| 166 Dartmouth Dr. | Please include |
| Toledo Oh 43614 | your PHONE # |
| Call TI-COMM BBS on 419 385 7484 | |
| for current prices or information | |
| 300 Baud, 7bit, e / 1200, 8, n | |

TEX+COMP

Celebrating Our Tenth Year

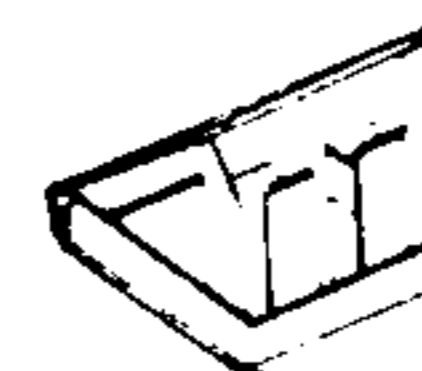
FREEWARE

THE TOP IN QUALITY, SELECTION AND VALUE

ONLY **\$4.95** Per Disk

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.

INCREDIBLE SOFTWARE



BONUS

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

GAMES • BUSINESS • GRAPHICS • WORD PROCESSING • UTILITIES • DATABASE • MUSIC • COMMUNICATIONS • HOME

The TEX-COMP Freeware program is a disk distribution service which is operated to support the TI-99/4A user and programmer and to keep the TI-99/4A the best value in the computer world. The nominal charge (4.95) that is charged for each title is for distribution services only and includes the cost of duplication, premium grade disks, labels, advertising and packaging including plastic disk cases that we include at no extra cost with orders of four or more disks. When a program requires more than one disk side, we supply a floppy or even a second disk at no extra cost. The programs we distribute come from all over the world and are either public domain or the author has expressly agreed to freeware distribution or has placed the program into freeware distribution by providing it to a commercial bulletin board service.



#1. THE SINGING TI-99/4A SPEECH & MUSIC DISK

This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Maltilda & much much more. 2 disk sides, speech & 32 K req. Exbasic autoloader.

#2. WHEEL OF FORTUNE, BLACKJACK & JOKER POKER

Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it!

#3. DUMPIT

This disk helps you transfer many TI modules to disk. Recommended for users with some programming ability. Ed/Assembler and "widget" recommended.

#4. PRINTART

Two disk sides filled with files that print out great quality pictures on most printers. Many famous TV and comic characters on this disk. "Beam me up Scotty."

#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME

This disk is packed full of assorted files of all types. Graphics, speech etc. Contains complete TI-TREK game for Speech Editor or TE-II module.

#5A. TI MUSIC/GRAPHICS

A great collection of music and matching graphics. Great examples of music & sprite programming.

#6. EXBASIC MUSIC

A two disk side collection of music & graphics that we consider some of the best.

#7. SPACE SHUTTLE MUSIC/GRAPHICS

One of the real outstanding examples of programming. This disk has it all. Great graphics, music, and continuity. A real salute to the space program. It is almost like watching a movie!

#8. LOTTO PICKER

This program randomly generates numbers for use in the various state lotto games and even runs a simulated lotto game. Easy to modify for pick 5 etc. games. A great learning and fun disk.

#9. MONA LISA PRINT OUT

This disk prints out a near photo quality picture of that lady with the classic smile. We understand it was made by digitizing the original with a super powerful computer and converting the output to run on the TI-99/4A. Impresses everyone who sees it! Requires Epson printer compatibility.

#10. GOTHIC PRINT

This disk lets you type out a phrase on the screen and then print it out in gothic (Old English) style. Looks like hand-lettered calligraphy. Use for invitations, announcements and business cards.

#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"

This disk was actually originally sent to TEX-COMP as a greeting from master programmer Ray Kazmer. It was just too good not to share! One of the best examples of computer animation and graphics you will see on any computer!

#12. TI-99 OLOPY

This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

#13. STRIP POKER (PG RATED)

Play Poker against your TI-99/4A. When you win a hand she loses--a piece of her clothes that is. Don't worry about being a lousy poker player. Another file is included where you don't even have to know an ace from a king.

#14. FIGURE STUDY (PG RATED)

A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

#15. STAR/EPSON PRINTER DEMO

This 2 sided disk contains a large collection of demo programs to put your Star/Epson compatible printer through its paces. Learn what control codes can do! Lots of text and graphics examples. Second side has a great tutorial on printer graphics with examples!

#16. SIDWAYS PRINTOUT

This program allows you to print out the material from your printer sideways. Great for spreadsheets, banners and large graphics. Second side contains some new enhancements for Multiplan not available on the TI upgrade.

#17. TI FORTH DEMO

This demo disk was released by TI to show the power of Forth. Fantastic music and graphics. Ed/Assem and 32K required!

#18. TI DIAGNOSTIC

This program loads into the Mini-Memory module and checks out your entire system. Much better than disk based diagnostics that cannot be used if a problem in the disk system is at fault. Complete documentation on second side.

#19. TI WRITER/MULTIPLAN UPGRADE

This disk released by TI adds real lower case to your TI Writer, speed to Multiplan and other enhancements. Easy to use.. just substitute new files for old! Instructions included.

#20. ACCOUNTS RECEIVABLE

This self contained prize winning program loads and runs in Exbasic and has all the features found in a professional accounting system. Complete with documentation and a second disk side with report generating programs.

#21. DATA BASE DEMO DISK

A professional data base program that was originally written to store various magazine articles from computer magazines and then find them by name, subject, key word, or publication. Fast, easy to use and easy to adapt for other applications. Come complete with sample data to make learning data base processing easy. Completely menu driven and unprotected.

Send order and make checks payable to

TEX+COMP

P.O. BOX 33084 — GRANADA HILLS, CA 91344

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mississippi 4.75%. Add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.

AUTHORIZED DEALER



TEXAS INSTRUMENTS



24 Hour Order Line

(818) 366-6631

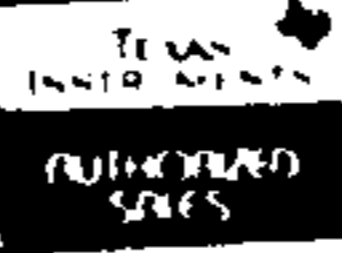
NOTE: Payment in full must accompany all orders. Credit card, Company check or Money order for immediate shipment. Personal Checks require up to 4 weeks to clear. California orders add 6.75% sales tax.

TEX+COMP

Celebrating Our Tenth Year

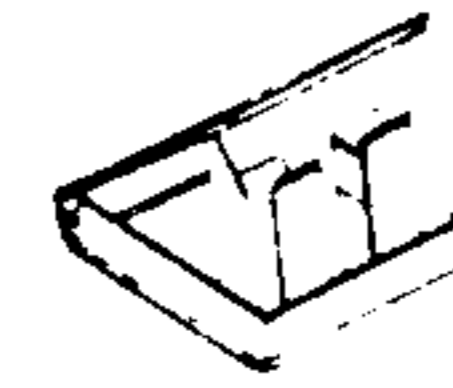
FREEWARE

•• Public Domain and Shareware for the
Texas Instruments TI-99/4A Computer.



ONLY **\$4.95** Per
Disk

Public Domain and Shareware
Programs to Meet Your Every
Computing Need.



BONUS

FREE DELUXE DISK STORAGE
CASE WITH EACH ORDER OF
FOUR OR MORE DISKS!!!

#22. ASTROLOGY

This one is as good as anything you will see in an arcade. Great color graphics and displays of the Zodiac. Enter your birthdate and learn about your sign, your lucky days and famous events in history on your birthday. Even prints out a report. Can be used as a great moneymaker at a charity event. Help guide your spouse's career.

#23. WILL WRITER

Enter your answers to a group of computer asked questions and this program then writes you a last will and testament. Now you can leave your TI-99/4A to your favorite nephew. Works with any printer. Appears legal in all states but better check that out!

#24. ENGINEERING CALCULATIONS

A two sided computer handbook of dozens of the most often used engineering and technical formulas. A real time saver. Does conversions, calculations and even designs electrical circuits. A must for anyone whose profession or hobby involves scientific calculations. Even has medical and communications applications.

#25. MEDICAL ALERT

This disk contains many menu accessible files covering most everyday medical emergencies. A good "what to do until the doctor or paramedic comes" guide. Well written and organized. Could very easily save a life!

#26. R RATED GAME

It was bound to happen. A talented (but demented) programmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 18 to order this one!!

#27. KIDS LEARNING

An educator in Georgia put this two sided disk collection of educational programs together. Contains great material. Math, geography, reading improvement, and even IQ testing. All high quality programs for kids of all ages.

#28. LOADERS AND CATALOGERS

We put together a collection of the best programs that catalog and load a group of programs on a disk. Just try them, pick the one you like and transfer it to another disk with the file name LOAD and you are in business.

#29. LABEL MAKER I

Two great programs for making custom labels for disks, addresses video tapes or any other application. Even contains a graphic display of the TI-99/4A console. Now you can create custom labels of any number by just typing in the lines as you want them. Uses standard tractor labels.

Send order and make checks payable to

TEX+COMP

P.O. BOX 33084 — GRANADA HILLS, CA 91344

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling. \$3.00 Minimum. East of Mississippi add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.

#30. HOUSEHOLD BUDGET PRINTOUT

With this disk you print out the data you have stored with the TI HBM Module. HBM is a great module that can be used for many home and small business applications but TI forgot to include a printout function. This program comes with full instructions and we are sure that your HBM Module will now start being used. Fantastic programming job.

#31. MORSE CODE TRAINER DISK

This disk has everything you need to learn and practice Morse Code for the various FCC license exams. It also is great for scout groups and school "ham" clubs for group training and merit badge qualification. Professional quality.

#32. EXBASIC XMAS MUSIC

Two disk sides full of high quality xmas music that can be played throughout the holiday season and then used as a learning tool since it contains wonderful arrangements and graphics. Autoloading and menu driven.

#33. CHECKERS & BACKGAMMON

A collection of great checkers and backgammon games for the TI-99/4A. These are professional in quality and will keep you busy for hours.

#34. SOLITAIRE & SCRABBLE

Another collection of classic games for the TI-99/4A. Exbasic & 32K req.

#35. PROGRAMMING AIDS & UTILITIES I

A collection of some unusual programs of interest to programmers. One program shows a group of opening title displays, another is a cross reference program as good as any of the commercial ones, plus a great disk management utility.

#36. STRICTLY BUSINESS

A collection of various programs for evaluating loans, calculating interest, and other financial items such as return on investment and security performance. Two disk sides filled with financial and business related programs.

#37. LAPD COOKBOOK

This unofficial police cookbook was put together by one of our boys in blue who is also a gourmet chef. (Yes, it contains jailhouse chili) Over 50 great recipes from soup to nuts on two disk sides and each separate side can be called up on screen or printer in exbasic from a menu. As good as any of the new PC computer cookbooks we have seen.

#38. GREAT 99/4A GAMES VOL. I

A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II

Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

#40. ARTIFICIAL INTELLIGENCE

This disk contains the famous computer program "Eliza" where you type in a question or a problem you are having and "Eliza" helps you find the solution. Also contains one of the better bio-rhythm programs so you can analyze all your emotional problems at one sitting.

#41. VIDEO GRAPHS MODULE BACKUP DISK

This disk is a backup of the discontinued Video Graphs Module from TI. For legal reasons, it can only be purchased for backup use by owners of the original module. Do not order UNLESS you have the original module and intend to use this disk only for backup purposes. Exbasic autoloading.

#42. FUNNELWEB FARM UTILITY

You heard about this one, now direct from Australia is the latest version of this fantastic utility that puts everything at your command. From one program you can access word processing, editor assembler, telecommunications and just about everything else. A freeware program complete with documentation on a second disk side.

#43. BEST OF BRITAIN, VOL I

Now for the first time, a collection of the best 99/4A games Britain has to offer including the famous "Billy Ball" series of arcade games. Great graphics, action and excitement.

#44. LABEL MAKER I GRAPHICS

A disk filled with graphics for the Label Maker I disk (#29). Dozens of great graphics for custom labels!

#45. BEST OF BRITAIN, VOL II

This disk contains an outstanding 3-D graphics adventure game for the TI-99/4A. Carfax Abbey lets you actually move through a four story mansion complete with bats and vampires. You actually are placed in each room and go up and down stairs and through secret panels. Legend of Zelda...look out!

#46. SUPER TRIVIA 99

A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

#47. INFOCOM RAPID LOADER

If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all documentation on disk.

AUTHORIZED DEALER



TEXAS INSTRUMENTS



24 Hour Order Line

(818) 366-6631

NOTE: Payment in full must accompany an order. Credit card companies may require pre-approval for orders. Personal Checks require up to 4 weeks to clear. California orders add 6% sales tax.

TEX+COMP

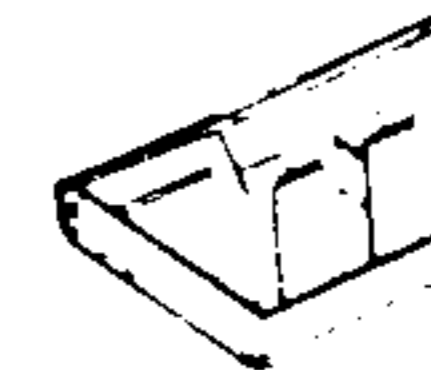
Celebrating Our Tenth Year

FREEWARE

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.

Public Domain and Shareware Programs to Meet Your Every Computing Need.

ONLY **\$4.95** Per Disk



BONUS

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

#48. GHOSTMAN (from England)
This Pacman/Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

#49. DEMON DESTROYER (from France)
This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.

#50. OH MUMMY (from Germany)
Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.

#51. BERLIN WALL (from Canada)
This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real challenge.

#52. ANIMATION 99 (from Germany)
THIS IS THE ONE!!! A demo disk filled with computer animation routines like you have never seen before on any computer. See famous cartoon figures move with more realism than on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

#53. HACKER/CRACKER
A collection of disk copying programs that copy TI disks by tracks. If one of these can't copy a protected disk nothing will. We included a collection of the very best ones including both TI and CorComp compatible. These programs require 2 disk drives and 32K of memory.

#54. ASTRONOMY
This program from Australia plots the heavens and teaches you about the solar system. A great learning and reference tool. Exbasic and 32K required. Don't confuse this one with our Astrology demo. They are not the same...ask Nancy!

#55. SCREEN DUMP
This program allows you to dump disk and even module programs to a Star/Epson compatible printer. Comes with easy to follow plans to build a load interrupt switch which is needed to dump module programs. This dump program by Danny Michael is considered the best of the bunch! Complete with documentation.

#56. SPREAD SHEET
OK, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

#57. TELCO
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

#58. PR BASE
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.

#59. GRAPH MAKER
A collection of the best programs for producing graphs and charts from your data. Exbasic and printer.

#60. FREDDY
A fantastic game where you guide the hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!

#61. THE MINE
A fast action game from F.R.G. that will keep you going for hours. Many screens and skills required.

#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOG
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!

#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!

#65. PERFECT PUSH
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in very way..graphics, speed and action!!!

#66. HEBREW TYPEWRITER
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!

#67. GENEALOGY
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exbasic autoloader.

#69. COMPUTER PLAYER PIANO/KEYBOARD CHORD ANALYSIS
A unique music program which displays a piano on the screen and actually plays your selections.

#70. TI RUNNER II
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

#71. KIDS LEARNING II
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.

#72. CERBERUS
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music.

#73. CRYPTO (gram)
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.

#74. LABEL MAKER II
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.

#75. DISK CATALOGER
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.

#76. PROGRAMMING AIDS AND UTILITIES II
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk.

#77. MICROdex 99
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included.

#78. ARTCON+ BY RAY KAZMER
ATTENTION GRAPHX AND TI ARTIST USERS!!! This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (2) for converting from Artist to Graphx.

#79. DM1000 V3.5
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.

#80. BIRDWELL DISK UTILITY
A must if you are into programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.

#81. HOME ACCOUNTING SYSTEM
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs.

#82. CROSSWORD PUZZLES
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.

#83. HOME APPLICATION PROGRAMS
A two disk side collection of useful programs for the home. Includes banking, cooking, home bar guide, utility records, and much much more. Something for everyone.

Send order and make checks payable to **TEX+COMP**
P.O. BOX 33084 — GRANADA HILLS, CA 91344

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 minimum). East of Mississippi: 4.5% Add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.



TEXAS INSTRUMENTS



24 Hour Order Line

(818) 366-6631

NOTE: Payment in full must accompany all orders. Credit card. Company check or Money order for immediate shipment. Personal Checks require up to 4 weeks to clear. California orders add 6.75% sales tax.

TEX+COMP

Celebrating Our Tenth Year

FREEWARE

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.

ONLY **\$4.95** Per Disk

Public Domain and Shareware Programs to Meet Your Every Computing Need.



BONUS

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

#84. GALACTIC BATTLE/SPY ADVENTURE

A pair of great commercial quality games from EB Software of TI Runner fame. Galactic Battle is a space "trek" type strategy game for one or more players. Spy Adventure is an adventure game that will keep you guessing for hours.

#85. AUTOBOOT UTILITY

This utility which can be installed on a disk loads and runs or displays most files. Now you can have a disk with exbasic programs, Editor Assembler programs and TI Writer files and run or display them all from exbasic.

#86. COLUMN TEXT III V3.2

A very useful utility for printing TI Writer and 99 Writer II files in separate spaced columns. Saves hours in producing a newsletter. Complete with documentation.

#87. ARCHIVER III

This utility allows you to "pack" or combine several files into one for space utilization. A number of boards are sending files packed to save transmission costs. This utility will let you pack and/or unpack these files.

#88. AUSSIE GAMES VOL 1

A collection of games from our friends down under. Includes a great card game and board game. Hours of fun and entertainment. Includes Matchmaker & TILO.

#89. PROCALC

This is an on screen calculator for decimal/hexidecimal conversions and much more. A must for the serious programmer.

#90. JET CHECKBOOK MANAGER

This checkbook manager is considered the ultimate with every feature you can think of for keeping track of your checking account and keeping records of your spending for budget and tax purposes. Complete with documentation.

#91. "THE MAZE OF GROG"(St. Valentine)

Ray Kazmer has created a great maze game with fantastic graphics and the characters from his now legendary "Woodstock" disk. Fun for all!!!

#92. HOUSEHOLD INVENTORY

Written by 99/4 programming great Charles Ehninger, this prize winner originally sold for \$59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

#93. THE 1991 KBGB GIRLIE CALENDAR

This latest offering from programming master Ken Gilliland prints out a jumbo 12 month calendar with a knock-out centerfold pinup for each month. If you like our #14 Figure Study disk, you will flip over this one. For Adults Only!! Exbasic & d/m printer.

#94. GREAT 99/4A GAMES VOL. III

If you have seen vols. 1 & 2 of this series you know we only provide the very best. This latest volume is also filled with a collection of great ones!

#95. WEATHER FORECASTER

The weather predictions are amazingly reliable and accurate! A great game "Lawnmower" and a mini database are also included to make this disk a fantastic value.

#96. STATISTICS & SORTING

Two great assembly utilities by John Clulow. STAT is a set of statistic routines for use in exbasic. SORT allows sorting by two separate fields and a choice of two types of sorts.

#97. MEMORY MANIPULATOR

This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

#98. DAYS OF EDEN & DOORS OF EDEN

Two bible games (non-fiction) that work with the TI Adventure Module.

#99. GREAT 99/4A GAMES VOL. IV

This disk features the works of J. Peter Hoddie. All of these games are of commercial quality and well worth the donation requested!

#100. ASSULT THE CITY (T. of DOOM)

An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

#101. ENCHANCED DISPLAY PACKAGE

This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Fully documented.

#102. COLOSSAL CAVES ADVENTURE

This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

#103. SORGAN, THE 99/4A ORGAN

This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

#104. C99 COMPILER AND LIBRARY

This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

#105. KING'S CASTLE+

A great arcade style assembly game formerly offered on module. Also includes an EB "Trek" game and a collection of sprite & graphics from Tigercub's Jim Peterson.

#106. QUEST (Dungeons & Dragons)

One of the best D&D games around! You must destroy the Dark Lord to free your homeland! Complete with documentation on disk.

#107. STAR TREK MUSIC ALBUM

Ken Gilliland's music and graphics version of the TV theme and the three motion pictures. (Exbasic)

#108. FUNLPLUS BY JACK SUGHRUE

Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbelievable collection of fantastic aids to make the best even better!

#109. TI-WRITER MINI MANUAL

This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Additional aids for using this powerful word processor are included.

#110. DISK + AID

A powerful disk sector editor formerly sold for \$20. Menu Driven and easy to use.

#111. POP MUSIC & GRAPHICS

This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

#112. INVOICE PACK

An excellent invoice preparation and printing program with instructions on how to modify it for your own business.

#113. LABEL MAKER 3

A collection of label programs to create mailing and disk envelopes, disk labels and much more!

#114. PANORAMA

A drawing and illustration program that compliments Graphx and TI Artist. A must for the serious 99/4A artist!

#115. GRAPHICS DESIGN SYSTEM

A complete system for creating graphic screens in full color for your programs by J. Peter Hoddie. Fully documented.

#116. FOURTH TUTORIAL

A lesson in FORTH programming on how to create graphics.

#117. UNIVERSAL DISASSEMBLER

This powerful utility written in Forth allows disassembly of programs off disk in any format, in memory, and even off of P-Box cards. Very complete with some very unique features.

#118. FAST TERM

One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TE-II, ASC11, and X-Modem transfers, print spooling and more. Loads from Exbasic or E/A.

#119. RAG LINKER

A utility for converting DIS/FIX 80 assembly object code files to PROGRAM image. This allows files to load faster and take up less space on disk. Full Doc.

#120. BITMAC

The original BITMAC is now available at \$4.95 with all original documentation. A powerful graphics program for the 4A which lets you print where you want...even over pre-existing text. Create great graphics in 16 colors, print text sideways, mirror image, upside down etc. etc. A must for anyone into 99/4A graphics. Comes with second bonus disk with utilities such as sign & banner makers. Even can computer generate your own signature!

#121. SUPER YAHTZEE & WHEEL II

If you like Yahtzee this disk is for you. A great version written in high speed assembly. Also included is another version of Wheel of Fortune which also lets you create your own puzzles with a puzzle edit program included.

#122. ADULT ADVENTURE

A truly adult adventure for use with the TI Adventure Module. Also included is a bonus adventure (not adult) "LOST GOLD" which is one of the better ones we have seen recently.

Send order and make checks payable to

TEX+COMP

P.O. BOX 33084 — GRANADA HILLS, CA 91344

TERMS: All prices FOB Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling (\$3.00 Minimum). East of Mississippi Add 3% for Credit Card orders. Prices and availability subject to change without notice. We reserve the right to limit quantities.

AUTHORIZED DEALER



TEXAS INSTRUMENTS



24 Hour Order Line

(818) 366-6631

NOTE: Payment in full must accompany all orders. Credit card Company check or Money order for immediate shipment. Personal Checks require up to 4 weeks to clear. California orders add 6.75% sales tax.



FREEWARE... THE TOP IN QUALITY, SELECTION AND VALUE

•• Public Domain and Shareware for the Texas Instruments TI-99/4A Computer.

TEX+COMP
Celebrating Our Tenth Year

ONLY **\$4.95** Per Disk

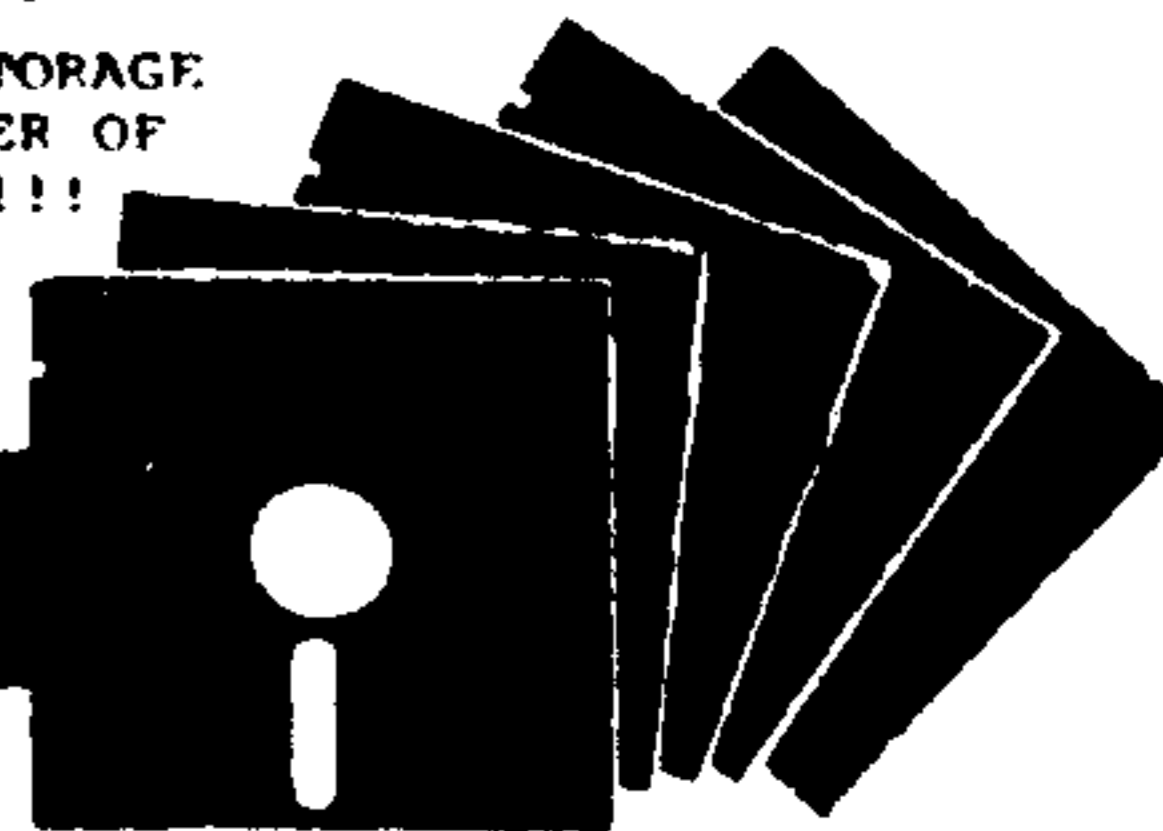
INCREDIBLE SOFTWARE

BONUS

FREE DELUXE DISK STORAGE CASE WITH EACH ORDER OF FOUR OR MORE DISKS!!!

GAMES • BUSINESS • GRAPHICS • WORD PROCESSING • UTILITIES • DATABASE • MUSIC • COMMUNICATIONS • HOME

Your biggest bargain in the computer market



Choose from the BEST!

#123. GREAT 99/4A GAMES, VOL V

THE FIFTH IN OUR BEST SELLING GAME COLLECTION SERIES. TWO DISK SIDES PACKED WITH THE BEST!

#124. GREAT 99/4A GAMES, VOL VI

TWO MORE DISK SIDES FILLED WITH THE BEST GAMES AVAILABLE.

#125. BLACKJACK & POKER

A DISK BACKUP FOR MODULE OWNERS.

#126. VIDEO CHESS

A DISK BACKUP FOR OWNERS OF THE ORIGINAL MODULE. LOADS IN ESBASIC!

#127. PIX-GRAPHICS UTILITY

THIS IS THE FREEWARE VERSION OF JIM REISS' UTILITY THAT CAN DISPLAY TI-ARTIST, GRAPHX AND RLE GRAPHICS AND CONVERT FORMATS.

#128. TETRIS--THE SOVIET MIND GAME!

THIS INTERNATIONAL HIT IS NOW AVAILABLE FOR THE 99/4A. EXBASIC AUTOLOAD AND ENGLISH INSTRUCTIONS.

#129. CASH DRAWER

A COMPUTERIZED CASH REGISTER PROGRAM THAT PRINTS RECEIPTS, COMPUTES DAILY TOTALS AND EVEN FIGURES SALES TAX.

#130. THE ORGANIZER

THE ORIGINAL ORGANIZER PROGRAM WHICH LETS YOU ORGANIZE, SCHEDULE AND ARRANGE BUSINESS AND PERSONAL ACTIVITIES!

#131. COMPUTER CRAPS

THE BEST CASINO CRAPS GAME AVAILABLE FOR THE 4A. COMES WITH FULL DOCUMENTATION.

#132. AMBULANCE

A DISK BACKUP OF THE ARCADE MODULE BY FUNWARE. LOADS IN EXBASIC!

#133. DRIVING DEMON

A DISK BACKUP OF THE ARCADE MODULE BY FUNWARE. LOADS IN EXBASIC!

#134. ROTO-RAIDER

A DISK BACKUP OF THIS HIT MODULE BY ROMOX. LOADS IN EXBASIC.

#135. ARCTURUS

A DISK BACKUP OF THE HIT SUNWARE ARCADE MODULE. TI'S ANSWER TO ZAXXON!

#136. ANT-EATER

A DISK BACKUP OF THIS HIT ROMOX MODULE

#137. CROSSFIRE

A DISK BACKUP FOR OWNERS OF THE ORIGINAL TI ACTION MODULE FROM SIERRA ON-LINE.

#138. FIREHOUSE COOKBOOK

A TWO DISK SIDE COLLECTION OF THE BEST FIREHOUSE RECIPES. FOR ANY BIG GROUP!

#139. MOONMINE

A DISK BACKUP FOR OWNERS OF THE MODULE

#140. MASH

A DISK BACKUP FOR OWNERS OF THE ORIGINAL

#141. MOONSWEEPER

A DISK BACKUP FOR OWNERS OF THE ORIGINAL

#142. TOUCH TYPING TUTOR

A DISK BACKUP FOR OWNERS OF THE ORIGINAL

#143. CONGO RONGO

A DISK BACKUP FOR OWNERS OF THE ORIGINAL

#144. STAR TREK

A DISK BACKUP FOR OWNERS OF THE ORIGINAL

#145. BUCK ROGERS

A DISK BACKUP FOR OWNERS OF THE ORIGINAL

#146. THE PRESIDENTS

A TI FIRST! THE BIOGRAPHIES OF EVERY U.S. PRESIDENT ON TWO DISK SIDES. GREAT FOR SCHOOL, TRIVIA AND HISTORY BUFFS.

#147. CALENDAR-NOTEPAD

THE BEST "CALENDAR MAKER" PROGRAM WE HAVE SEEN. KEEP TRACK OF APPOINTMENTS, SPECIAL OCCASIONS AND PRINT OUT ANY MONTH. INCLUDES A GREAT CALENDAR UTILITY FOR ANY DAY/DATE IN THE FUTURE!

#148. KENO & SLOTS

TWO TOP RATED GAMES BY BOB GASTONI. THE VERY BEST AND REALISTIC KENO GAME WE HAVE SEEN. JUST LIKE VEGAS!

#149. GREAT 99/4A GAMES VOL. VII

FEATURES "BLOCKBUSTER" THE ULTIMATE MULTI-LEVEL BREAKOUT GAME PROGRAMMED IN C.

#150. ULTIMATE TRIVIA

A COLLECTION OF SEVEN INFORMATIVE AND THINKING TYPE TRIVIA GAMES-THE BEST!!



ATTENTION!!!

ATARI SOFT OWNERS!

NOW GET DISK BACKUPS OF ALL YOUR MODULES FOR ONLY \$4.95 EACH. EXBASIC AUTOLOAD!

JUNGLE HUNT

PAC MAN

Ms. PAC MAN

POLE POSITION

CENTIPEDE

DIG DUG

DONKEY KONG

DEFENDER

PICNIC PARINOIA

PROTECTOR II

SHAMUS

MOON PATROL \$4.95 each

24 HOURS A DAY
7 Days a Week!



TEX+COMP

AMERICA'S NUMBER ONE
TI COMPUTER RETAILER

P.O. Box 33084, Granada Hills, CA 91344



Charge-it On Your
Visa or MasterCard
ORDER BY PHONE



(818) 366-6631

TERMS: All prices F.O.B. Los Angeles. For fastest service send cashiers check or money order. Personal checks require up to 15 days to clear. Prices reflect a 3% discount for cash or approved check. Add 3% for Credit Card orders. Prices and availability are subject to change without notice. We reserve the right to limit quantities. California orders add 6.5% sales tax.

BASIC/Assembly

Taking a snapshot and developing it into source code

By **BARRY TRAVER**

©1991 B. Traver

Have you been busy speeding up the graphics statements in XB programs by converting them into super-fast assembly equivalents using GRAPHICOMP? That's fun to do! (I did it with a whole collection of music programs by Sam Moore Jr.) In working with GRAPHICOMP, however, you may have discovered that it has definite limitations: the XB code must be in single-statement lines, and all of the parameters must be constants. In addition, there are many things that GRAPHICOMP cannot handle (e.g., FOR/NEXT loops, which are often used in setting foreground/background colors for character sets).

Well, if you've found some XB programs that GRAPHICOMP won't work with, I have good news for you. This month's column features VDP/SAVER, a powerful utility that can write source code to recreate any screen that can be created by an XB program! That may sound too good to be true, but it isn't.

The approach is different from the approach used in GRAPHICOMP. In this case, we don't really care what commands XB uses to create the screen display. We let the XB program create the screen for us, and then we take a "snapshot" of it. All video information (character definitions, sprites, etc.) is stored in VDP RAM, so VDP/SAVER lets the XB program do the work in painting the screen, and then it just takes a picture of the relevant parts of VDP RAM, saving the information in an assembly source code file with routines that can put the information back exactly where it came from.

To do this, we need to do some PEEKing into VDP RAM, of course, so we'll need the PEEKV routine from the previous article in this series. If you don't have that issue handy, here's an abbreviated form of what you need:

```
* PEEKV/S (BARE-BONES)
COPY "DSK1.GET/SEND/S"
DEF PEEKV
PEEKV LWPI WS
BL @GET
MOV @PARAM3,R2
SWPB R2
MOVB R2,@PARAM2
MOV @PARAM1,R0
SWPB R2
LI R1,PARAM2+1
BLWP @VMBR
B @SEND
END
```

With this simple routine, we can do almost all of the PEEKing into VDP areas that we need information about. I say "almost," because you may remember that the TI does have write-only video registers which cannot be read (sort of like the op-

This month's column features VDP/SAVER, a powerful utility that can write source code to recreate any screen that can be created by an XB program! That may sound too good to be true, but it isn't.

posite of read-only memory?). That's no big deal, however. For normal graphics mode, this affects only two items of information:

1. The screen color created by CALL SCREEN and;
2. The sprite magnification factor (which is not important, of course, unless the display makes use of sprites).

We can discover these two items of information fairly simply by looking at the

XB code, and VDP/SAVER can PEEK into VDP RAM and discover by itself all the other information that is needed (thanks to the PEEKV assembly routine that will be embedded in VDP/SAVER).

Here are the steps you need to follow in order to create VDP/SAVER:

1. Type in VDP/START, and save it as a MERGE file by entering the command SAVE DSK1.VDP/START,MERGE.
2. Type in PEEKV/S, and save it on the same disk, along with GET/SEND/S (from a previous issue of MICROpendium).
3. Assemble DSK1.PEEKV/S to create DSK1.PEEKV/O.
4. Find ALSAVE and ALLOADM (from another past issues of MICROpendium), and put them on the same disk as well.
5. In XB, enter the following commands, one by one:

```
NEW
CALL INIT
CALL LOAD("DSK1.PEEKV/O")
CALL LOAD("DSK1.ALSAVE")
CALL LINK("SAVE")
100 REM
MERGE DSK1.ALLOADM
MERGE DSK1.VDP/START
SAVE DSK1.VDP/SAVER
```

It's a bit more complicated than writing a normal XB program, but your VDP/SAVER now has an assembly routine (PEEKV) embedded along with the XB code (and that's something I hope you have done before!).

All right, you're half-way there. (Only "half-way?") VDP/SAVER is now ready to use, BUT whenever you use it, you have to add to VDP/SAVER the XB code that creates the screen display that you want to save and convert into assembly. We will thus use MERGE yet one more time, but before we can do that you have to isolate the XB statements that create the screen display.

They may be part of a long XB program, (See Page 26)

BASIC/ASSEMBLY—

(Continued from Page 25)

but there are lots of ways that you can separate out the code that creates the screen. Here are a few:

1. You can LIST the full XB program to disk, use the TI-Writer editor to edit out the lines you don't want, save the result to disk, and use a program such as XLATE to convert the DV80 file into the MERGE file you want, or;

2. You can save the full XB program to disk in MERGE format, and then use my MERGEDITOR or some similar utility to separate out the part you want, or;

3. You can use the Super Extended BASIC module to DELETE the lines that you want to remove, and then save what's left to disk as a MERGE file, OR

4. you can manually delete the unwanted lines by hand one by one, which can be tiresome if it's a long program (sigh).

The object is to create a MERGE file that you can then MERGE with (i.e., add to) VDP/SAVER. (Note: because of the embedded assembly code in VDP/SAVER, you MUST do it that way and not the other way around. Unlike my TOKEN/READ program, you cannot start with the XB program and then MERGE the utility with it.)

Many variations in procedure are allowable once you're comfortable in using VDP/SAVER (e.g., you don't really even have to separate out the section of code in your XB program that creates the screen display!), but I recommend at first the following procedure for the sake of simplicity. When you have extracted the XB portion that produces the screen display, RE-Sequence it and add a line at the end which will GOTO itself. For example, if lines 100 to 390 produce the screen display, then add 400 GOTO 400 at the end. Run your extracted code to be sure that it does what you think it should do. If it does, do a FCTN-4 to break the program and enter the following commands:

```
SAVE DSK1.GRAPHICS,MERGE
```

```
OLD DSK1.VDP/SAVER
```

```
MERGE DSK1.GRAPHICS,MERGE
```

Take heart: we're almost ready. You do have to make one more modification before you run the program: you have to replace the GOTO line mentioned earlier (line 400 in the example) with the contents

of line 7 of VDP/SAVER. Here's how you do it:

1. Type in 7 and press FCTN-X to bring up the line;

2. Press (enter);

3. Press FCTN-8 to bring up the line again so that you can edit the beginning of the line (including line number), and;

4. Replace the starting "7 !" (including the exclamation point) with the line number of the GOTO line (400 in the example). (Line 7 remains a REM, but the new line is now a "working" line.) Then run the program!

For the sake of efficient code (rather than simply taking a snapshot of everything in VDP RAM), VDP/SAVER will ask some questions before it goes to work. If the XB program doesn't use sprites, there is no point in saving the sprite tables in VDP RAM. If no character definitions are changed, you don't need to save that area of VDP RAM. If foreground and background colors are unchanged, there's no need to take a picture of that information. And so on.

One nice thing about VDP/SAVER is that you can select which character definitions you want to save. If, for example, you want to save the definitions for characters 35-37, 47, and 123-143, all you have to do is enter the first and last characters for each "range." In this case, you would enter 35, 37; 47, 47 (or just press enter), 123, and 143. When you're finished, just press enter again at the prompt for first character number to let VDP/SAVER know that you've finished.

After you've given VDP/SAVER the information it needs to know (including what you want to call your source code file), it will go to work. The graphics display will be put on the screen, and VDP/SAVER will begin taking various snapshots and saving the information in the source code file. Unlike GRAPHICOMP, however, you won't see the assembly code as it is being created (it would mess up the screen!). When it is done, it will let you know that it is "FINISHED!"

By now you should be familiar with the procedure for embedding assembly routines in XB programs, but for the sake of completeness, we'll finish off the instructions. Suppose VDP/SAVER created the

```
source code file DSK1.SOURCE.
then assemble that file, creating, say,
DSK1.OBJECT. Then you load in your
original complete XB program (not the
portion you extracted), and delete the lines
that created the screen display, replacing
them with a simple CALL LINK("VDP").
Then enter the following commands:
SAVE DSK1.PROGRAM,MERGE
NEW
CALL INIT
CALL LOAD("DSK1.OBJECT")
CALL LOAD("DSK1.ALSAVE")
CALL LINK("SAVE")
100 REM
MERGE DSK1.ALLOADM
MERGE DSK1.PROGRAM
SAVE DSK1.PROGRAM
```

You're done! The procedure may have taken a little time (although it sounds more complicated than it really is), but the final result is a version of your original XB program that gives you an instantaneous screen display, thanks to the embedded assembly routine. (If you use different program names for the routines — VDP, VDP2, etc. instead of just VDP — in the source code, you can do this for more than one screen display in an XB program; just use VDP/SAVER to create the source code one screen display at a time.) As I said at the beginning, it doesn't matter how complicated the original XB code is, VDP/SAVER can handle it, because it takes its pictures after the screen is fully composed.

I hope that you are not merely reading these articles, but actually trying out the programs. If you don't want to take the time to type in VDP/SAVER, you can either order the current volume of MICROpendium-on-disk (recommended!) or send a check for \$4 to Barry Traver, 835 Green Valley Drive, Philadelphia, PA 19128, specifying that you want the VDP/SAVER program. I hope that the two programs GRAPHICOMP and VDP/SAVER are adequate for your graphics needs, because next time we'll be moving along to a different topic. (Graphics is important to any program, but there are many other exciting things that can be done in assembly!) Until next time, keep on computing! (See page 27 for program listing—Ed.)

BASIC/ASSEMBLY—

```

! CALL VDPRAM(N$,F(),L(),S
PFLAG,SCFLAG,DFLAG,SFLAG,CFL
AG,MAG):: STOP !068
8 ! VDP/SAVER COPYRIGHT (C)
1991 BY BARRY A. TRAVER, 835
GREEN VALLEY DRIVE, PHILADE
LPHIA, PA 19128 (PHONE: 215
/483-1379) !031
9 DIM F(20),L(20):: CALL SET
UP(N$,F(),L(),SPFLAG,SCFLAG,
DFLAG,SFLAG,CFLAG,MAG)!203
10 ! VDP/START - READ MICROP
ENDIUM ARTICLE TO CONVERT TH
IS INTO VDP/SAVER ! !0843210
0 SUB SETUP(N$,F(),L(),SPFLA
G,SCFLAG,DFLAG,SFLAG,CFLAG,M
AG)!076
32105 CALL CLEAR :: PRINT "V
DP/SAVER BY BARRY TRAVER":""
:: INPUT "SAVE SPRITE INFO?
(Y/N) ":R$ :: IF R$="Y" THE
N SPFLAG=1 ELSE 32115 !036
32110 INPUT "MAGNIFICATION?
(1-4) ":MAG !019
32115 INPUT "SAVE SCREEN COL
OR? (Y/N) ":R$ :: IF R$="Y"
THEN SCFLAG=1 ELSE 32125 !16
8
32120 INPUT "SCREEN COLOR? (
1-16) ":N :: N=N-1 :: N$=STR
$(N)!069
32125 INPUT "SAVE CHAR DEFS?
(Y/N) ":R$ :: IF R$="Y" THE
N DFLAG=1 :: Q=1 ELSE GOTO 3
2145 !121
32130 INPUT "FIRST CHAR #? "
:R$ :: IF R$="" THEN F(Q),L(
Q)=999 :: GOTO 32145 ELSE F(
Q)=VAL(R$)!127
32135 INPUT "LAST CHAR #? "
:R$ :: IF R$="" THEN L(Q)=F(
Q)ELSE L(Q)=VAL(R$)!073
32140 Q=Q+1 :: GOTO 32130 !2
35
32145 INPUT "SAVE SCREEN? (Y
/N) ":R$ :: IF R$="Y" THEN S
FLAG=1 !124
32150 INPUT "SAVE COLOR TABL
E? (Y/N) ":R$ :: IF R$="Y" T
HEN CFLAG=1 !184
32155 INPUT "OUTPUT FILE? ":
O$ :: OPEN #1:O$.OUTPUT !008
32160 SUBEND !168
32165 SUB VDPRAM(N$,F(),L(),
SPFLAG,SCFLAG,DFLAG,SFLAG,CF
LAG,MAG)!134
32170 CALL OPEN !155
32175 IF SPFLAG=1 THEN CALL
SPRITES(MAG)!129
32180 IF SCFLAG=1 THEN CALL
SCOLOR(N$)!184
32185 IF DFLAG=1 THEN CALL C
HARS(F(),L())!177
32190 IF SFLAG=1 THEN CALL S
CRNTABLE !101
32195 IF CFLAG=1 THEN CALL C
OLORS !134
32200 CALL CLOSE !224
32205 SUBEND !168
32210 SUB OPEN !159
32215 PRINT #1:"* THIS ASSEM
BLY SOURCE CODE":"* WAS
CREATED BY":"* VDP/SAVER (
VERS. 1.1)," !229
32220 PRINT #1:"* BY BARR
Y A. TRAVER":"* 835 GREEN V
ALLEY DRIVE":"* PHILADELPHI
A, PA 19128":"* (PHONE: 21
5/483-1379)":"" !210
32225 PRINT #1:"* ACCESSED B
Y":"* CALL LINK("VDP")":""
!153
32230 PRINT #1:"* XB EQUATES
":"":"BASIC EQU >006A":"GP
LWS EQU >83E0":"VMBW EQU
>2024":"VSBW EQU >2020"
:"VWTR EQU >2030":"" !101
32235 PRINT #1:"* DEFINE WOR
KSPACE":"":"WS BSS 32":
"" !062
32240 PRINT #1:"* DEFINE ENT
RY POINT":"":" DEF VD
P":"" !208
32245 PRINT #1:"* START THE
PROGRAM":"":"VDP LWPI WS"
:"":"* CLEAR THE SCREEN":""
!193
32250 PRINT #1:" CLR
R0":" LI R1,>8000":"
LI R2,768":"CLRSCR
BLWP @VSBW" !191
32255 PRINT #1:" INC
R0":" DEC R2":"
JGT CLRSCR":"" !107
32260 SUBEND !168
32265 SUB SPRITES(MAG)!220
32270 CALL LINK("PEEKV",768,
A$,152):: CALL LINK("PEEKV",
1920,V$,152):: CALL PEEK(-31
878,SN):: IF MAG=0 THEN 3228
5 !008
32275 PRINT #1:"* SET SPRITE
MAGNIFICATION":"":" L
I R0,>01E"&STR$(MAG-1):"
BLWP @VWTR" !135
32280 PRINT #1:" SWPB
R0":" MOVB R0,@>83D4":
"" !043
32285 PRINT #1:"* GO TO SPRI
TE TABLE ROUTINES":"":"
B @SPRT":"" !151
32290 PRINT #1:"ADATA";!035
32295 FOR J=1 TO 112 STEP 4
:: B$=SEG$(A$,J,4):: C$="BYT
E "&STR$(ASC(SEG$(B$,1,1))&
"," !011
32300 FOR K=2 TO 3 :: C$=C$&
STR$(ASC(SEG$(B$,K,1))&","
:: NEXT K !249
32305 C$=C$&STR$(ASC(SEG$(B$
,4,1))): PRINT #1:TAB(8);C$
!044
32310 NEXT J !224
32315 PRINT #1:"": "VDATA";!1
80
32320 FOR J=1 TO 112 STEP 4
:: B$=SEG$(V$,J,4):: C$="BYT
E "&STR$(ASC(SEG$(B$,1,1))&
"," !032
32325 FOR K=2 TO 3 :: C$=C$&
STR$(ASC(SEG$(B$,K,1))&","
:: NEXT K !249
32330 C$=C$&STR$(ASC(SEG$(B$
,4,1))): PRINT #1:TAB(8);C$
!044
32335 NEXT J !224
32340 PRINT #1:"": "* SET SPR
. ATT. TABLE":"" !084
32345 PRINT #1:"SPRT LI
R0,768":" LI R1,ADAT
A":" LI R2,112":"
BLWP @VMBW":"" !226
32350 PRINT #1:"* SET SPR. V
EL. TABLE":"" !214
32355 PRINT #1:" LI
R0,1920":" LI R1,VDA
TA":" LI R2,112":"
BLWP @VMBW":"":"
LIMI 2":" LIMI 0":"" !
156
32360 PRINT #1:"* SET MAX NU
M. OF SPRITES":"" !029

```

(See Page 28)

BASIC/ASSEMBLY—

(Continued from Page 27)

```

32365 PRINT #1:"          LI
R0,"&STR$(SN):"          SLA R
0,8":"          MOVB R0,@>837A"
:"          !004
32370 SUBEND !168
32375 SUB SCOLOR(N$)!032
32380 CALL SC_CONV(N$)!118
32385 PRINT #1:"* CHANGE SCR
EEN COLOR:":"          LI R
0,>070"&N$:"          BLWP @VWT
R:"          !241
32390 SUBEND !168
32395 SUB CHARS(F(),L())!107
32400 Q=1 !009
32405 LL$=STR$(L(Q)):: L(Q)=
L(Q)-F(Q)+1 :: FF$=STR$(F(Q)
): F(Q)=768+8*F(Q)!026
32410 PRINT #1:"* GO TO CHAR
DEF ROUTINE:":"          B
@CHRS"&STR$(Q):"          !004
32415 PRINT #1:"HDTA"&STR$(Q
);!057
32420 FOR I=0 TO L(Q)-1 !003
32425 CALL LINK("PEEKV",F(Q)
+8*I,A$,8)!156
32430 B$="BYTE "&STR$(ASC(SE
G$(A$,1,1)))&"," !061
32435 FOR J=2 TO 7 :: B$=B$&
STR$(ASC(SEG$(A$,J,1)))&","
:: NEXT J !247
32440 B$=B$&STR$(ASC(SEG$(A$
,8,1)))!222
32445 PRINT #1:TAB(8);B$ !20
4
32450 NEXT I !223

```

Ottawa group has new program disk

The Ottawa TI99/4A Users Group is now offering Volume 4 of Lucie Dorais' **Fast Extended BASIC Tutorials and Programs**.

This disk contains 10 new programs, among which are the Balldrop game, a utility to rotate TI-Artist Instances, drawing programs to emulate abstract painters Mondrian and Vasarely, a study of visual perception and a French Christmas carol.

The disk is available from the Librarian, Ottawa TI99/4A Users' Group, 3489 Paul Anka Dr., Ottawa, Ontario, Canada K1V 9K6 for \$2 plus postage. Dorais' Vols. 1-3 are also available at the same price.

```

32455 PRINT #1:"          :: IF FF$=
LL$ THEN PRINT #1:"* DEFINE
CHAR "&FF$:"          :: GOTO 32465
!099
32460 PRINT #1:"          :* DEFINE
CHARS "&FF$&" THROUGH "&LL$:
"          !129
32465 PRINT #1:"CHRS"&STR$(Q
);TAB(8);"LWPI WS:"          !182
32470 PRINT #1:"          LI
R0,"&STR$(F(Q)):"          LI
R1,HDTA"&STR$(Q):"          LI
R2,"&STR$(L(Q)*8):"
BLWP @VMBW:"          !194
32475 Q=Q+1 :: IF F(Q)<>999
THEN 32405 !166
32480 SUBEND !168
32485 SUB SCRNTABLE !016
32490 DIM A(24),L(24)!004
32495 PRINT #1:"* GO TO SCRE
EN ROUTINE:":"          B
@SCREEN:"          :* DATA FOR DISP
LAY" !070
32500 FOR I=0 TO 767 STEP 32
:: CALL LINK("PEEKV",I,A$,3
2):: R=R+1 :: L(R)=32 :: A(R
)=32*(R-1)!022
32505 IF A$="" THEN 32545 !1
35
32510 X=ASC(SEG$(A$,1,1))::
IF X=127 OR X=128 THEN A$=SE
G$(A$,2,LEN(A$)-1):: L(R)=L(
R)-1 :: A(R)=A(R)+1 :: GOTO
32505 !176
32515 IF A$="" THEN 32545 !1
35
32520 X=ASC(SEG$(A$,LEN(A$),
1)):: IF X=127 OR X=128 THEN
A$=SEG$(A$,1,LEN(A$)-1):: L
(R)=L(R)-1 :: GOTO 32515 !10
8
32525 PRINT #1:"          : "ROW"&STR$(
R):: AC$="BYTE " !148
32530 FOR P=1 TO LEN(A$):: O
=ASC(SEG$(A$,P,1)):: AC$=AC$
&STR$(O)&"," :: IF P/8<>INT(
P/8)AND P<>LEN(A$)THEN 32540
!217
32535 AC$=SEG$(AC$,1,LEN(AC$
)-1):: PRINT #1:TAB(8);AC$ :
: AC$="BYTE " !241
32540 NEXT P !230
32545 NEXT I :: PRINT #1:"          :
"
EVEN" !005
32550 PRINT #1:"          :* DISPLAY

```

```

SCREEN:"          : "SCREEN";:: F
R=1 TO 24 :: IF L(R)=0 THEN
32560 !054
32555 PRINT #1:TAB(8);"LI
R0,"&STR$(A(R)):"          LI
R1,ROW"&STR$(R):"          LI
R2,"&STR$(L(R)):"          BL
WP @VMBW:"          !009
32560 NEXT R !232
32565 SUBEND !168
32570 SUB COLORS !065
32575 PRINT #1:"* GO TO COLO
R TABLE ROUTINE:":"          B
@COLORS:"          !117
32580 PRINT #1:"CDATA";:: CA
LL LINK("PEEKV",2063,A$,16)!
056
32585 FOR J=1 TO 16 STEP 8 :
: B$=SEG$(A$,J,8):: C$="BYTE
"&STR$(ASC(SEG$(B$,1,1)))&
," !229
32590 FOR K=2 TO 7 :: C$=C$&
STR$(ASC(SEG$(B$,K,1)))&","
:: NEXT K !253
32595 C$=C$&STR$(ASC(SEG$(
,8,1))):: PRINT #1:TAB(8);C
!048
32600 NEXT J !224
32605 PRINT #1:"          :* SET COL
OR TABLE:"          !117
32610 PRINT #1:"COLORS LI
R0,2063:"          LI R1,CDA
TA:"          LI R2,16:"
BLWP @VMBW:"          !038
32615 SUBEND !168
32620 SUB CLOSE !228
32625 PRINT #1:"* RETURN TO
EXTENDED BASIC:":"          L
WPI GPLWS:"          B @BAS
IC:"          : "
END:"          !003
32630 CLOSE #1 :: DISPLAY AT
(14,11)ERASE ALL:"FINISHED!"
!241
32635 SUBEND !168
32640 SUB SC_CONV(N$)!122
32645 D=0 :: L=LEN(N$):: FOR
I=1 TO L :: D=D+(POS("01234
56789ABCDEF",SEG$(N$,I,1),1
-1)*10^(L-I)):: NEXT I :: N$=
"          !201
32650 Q=INT(D/16):: N$=SEG$
"0123456789ABCDEF",D-16*Q+1,
1)&N$ :: IF Q<>0 THEN D=Q ::
GOTO 32650 !048
32655 SUBEND !168

```

MY-BASIC**An update for MY-PAINT
and some odds and ends**By **JIM UZZELL**

©1991 DDI Software

Those who have used Paintprint will know that the blue (6) background has a character pattern, and the default background of MY-PAINT is blue. Sometimes this is not desirable, so make the following changes to MY-PAINT and the background will be transparent, which will print the same as white-no pattern.

```
Change the 6 to 1 in the following lines;
TCOLOR 220,300,1240,1620,1640,2110,2130
DCOLOR 330,1470,1600,1620,1880
ECOLOR 220
MEMSET 420
```

Unfortunately, pictures that have already been painted will have to be repainted, or use a sector editor to change each picture. I am sure that some of you have discovered that "transparent" is available as a drawing color.

Some of you may have noticed the first page of the drawing tablet is a 24-row x 40-column display. Type in the following, then load and save in merge format. Merge this routine into Paintsee and this will give you an additional option of display. I am sure some of will figure out a way to change this into data statements and use CHAR and CHR\$ to place it on the screen quickly instead of using the slow HCHAR method. Another thought, paint two first pages then in MODE(3,3) display them side by side for a full screen display.

```
735 DISPLAY AT(16,19):"5 FULL SCREEN" :: DISPLAY AT(17,22):"1st PAGE OF MYPAIN
" :: DISPLAY AT(18,22):"24Rx 40C"
740 CALL KEY(0,K,S) :: IF S=0 THEN 740
750 CLS :: ON K-48 GOTO 310,220,380,520,800
800 ! FULL SCREEN
810 CALL CHAR(255,"FCFCFCFCFCFCFCFC")
820 U=1 :: FOR X=1 TO 24 ::
M=0 :: FOR Y=1 TO 80 STEP 2
830 J(Y)=VALHEX(SEG$(J$(U),Y,2))
```

```
840 CALL TCOLOR(J(Y),5)
850 CALL HCHAR(X,Y-M,255)
860 M=M+1 :: NEXT Y :: U=U+1
:: NEXT X
870 CALL RESETPLT :: CALL TCOLOR(16,5)
880 CALL KEY(0,K,S) :: IF S=0 THEN 880
```

Since I do not have any source code for MY-BASIC, what follows is the result of hacking. I believe it is accurate, but no guarantees.

```
ASSM BLOCK >2000 TO >E000 = 49152 bytes
Minus UTIL >2000 TO >24F4 = -1268
Minus UTIL* >DF68 TO >DFFF = -152
```

```
SPACE AVAILABLE FOR PGMS 47732
PRINT FREESPACE(3)= 47732
```

*See MICROpendium September 1990 for list.

List of each memory page based on allocation:

```
>FAF0 TO >FBID
```

Command line input buffer:

```
>F500 TO >F5FF 256 bytes
```

Not all 256 bytes are available;

```
WORD AT >F500 Reserved
```

```
BYTE AT >F503 length of input statement
```

Upon pressing Enter, >F600 and up is the area that the interpreter uses to process the statement.

In GRAPHICS(1,1) mode, enter this statement from command mode;

```
CALL PEEK(-2560,A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S)::PRINT
A;B;C;D;E;F;G;H;I;J;K;L;M;N;O;P;Q;R;S
```

You should get this;

```
246,102,0,98,157,200,4,80,69,69,75,183,194,200,4,50,53,54,48 (Consult ASCII chart page 15, April 1991).
```

These numbers are the internal coding for CALL PEEK -2560 — which is only 15 characters long, but required 19 bytes to process. What does all of this mean? With 252 bytes available (256-reserved and length) for input, the interpreter buffer may not be able to process input because of the internal coding required.

The following is a demo program to test PEEKV. It can also be used as a

quickscreen dump to a printer.

```
100 CALL GRAPHICS(1,1)
110 CLS
120 B$="SCREEN TEST FOR PEEK
V(XXXX)-"
130 FOR Y=1 TO 24
140 DISPLAY AT(Y,1):B$
150 ! REMOVE ! IN 160 FOR GRAPHICS(3,1)
160 ! DISPLAY AT(Y,40):B$
170 NEXT Y
180 CALL VCHAR(1,31,88,96)
190 OPEN #1:"PIO"
200 FOR X=1024 TO 1791
210 !CHG 200 TO X=0 TO 959 FOR OR MODE(2,1)
220 !CHG 200 TO X=0 TO 2048 FOR (3,1)
230 CALL PEEKV((X,A)
240 IF (A<32) OR (A>126) THEN PRINT #1:A; ELSE PRINT #1:CHR$(A);
250 NEXT X :: CLOSE #1 :: END
260 !DON'T FORGET TO
270 !CHG LINE 100
```

Make the following changes to the demo program for POKEV in the MY-BASIC manual, then run.

```
1 CALL GRAPHICS(1,1)
130 CALL POKEV((R*32+C)+1024,X)
170 CALL KEY(0,K,S)::IF S=0 THEN 170
```

Make these changes and run again.

```
1 CALL GRAPHICS(3,1)
120 FOR C=0 TO 31 STEP 3
125 DISPLAY AT(R+5,C+2+C):CHR$(X);
130 CALL POKEV((R*32+C)+1920,X)
```

Some may say that the demo program in the manual is another example of the lack of expertise that MYARC has demonstrated these past few years.

The following demo program shows how to display the 256 colors.

```
1 REM 256 COLORS
2 REM 255=BLACK 0=WHITE
50 CLS
```

(See Page 30)

Deciphering Fast-term parameter files

By JOHN CREVISTON JR.

One of the most widely used terminal emulator programs for the TI 99/4A is Fast-Term by Paul Charlton. Paul wrote the program to load a parameter file when the program is first started. The parameter file is written by a program distributed with Fast-Term called DEFAULT.

This program was written because I couldn't find a readily available program that deciphered the parameter files after they were written. Many times there have been questions from members of the Dallas TI Home Computer Group (known as DTIHCG and pronounced DITTY-HUG) asking how to tell how their files were configured. The response was usually to load the file and check the settings. That is okay for baud, bits, parity, and color, but not for key repeat delays or STOP and START characters. Someone always asked "... why isn't there a program to tell us how the file was written?"

Since the parameter file is nothing more than cryptic codes for the different options, you cannot simply look at the file and learn anything. For example the first character is used for modem baud rate. You will not find 300 or 1200 but a 0 to 7. The 0 means 110 baud while the 7 means

19200. The delay and color codes are not even that simple.

This program is written to display all of the settings from the file except for color. The screen is set to the file selected colors. After the original version of this program was viewed by some members of the DTIHCG, a question was raised about having the information printed to paper. That was accomplished with a somewhat mixed code. Because the screen is always file #0 and the boolean expression TRUE/FALSE works with 1 and 0, a single variable is used in the program to make decisions about what and where to print the information. More about that in the lines description.

In addition to the colors being set, code can be included to have the BELL or CHIMES played. The easiest way to accomplish that is with the Super Extended BASIC module. Another way is to use a CALL LINK to assembly routines that make the tones. An excellent way to create a hybrid code with the XB statements and the AL sound CALLs is to use Todd Kaplan's public domain program ALSAVE published in Barry Traver's September 1990 BASIC/Assembly column.

The original terminal emulator program

used the CHIMES data as listed in the Editor/Assembler Manual from TI. I used that and the BELL to produce the same sound you hear when using FT. While the tones are nice, they are not essential for the use of this program.

ABOUT THE PROGRAM

Line 100 names the author of the XB code lines.

Line 110 is the code to move the AL routines with ALSAVE.

Line 120 is the default printer name.

Line 130 is the screen title.

Line 140 asks if you want printed results.

Line 150 inputs your response and sets the variable DD accordingly.

Line 160 inputs the printer device name. As with many TI print functions you can set the PRINTER DEVICE to either a true printer or a disk file name.

Line 170 dimensions the variable A.

Line 180 inputs the file name to be deciphered.

Lines 190-200 input the data from the file. If the file is not a Fast-Term Parameter file compatible with release 1.16x, then an error is displayed and the program restarted.

(See Page 31)

MY-BASIC—

(Continued from Page 29)

```
70 CALL GRAPHICS(2,3)
80 CALL CHAR(129,"FFFFFFFF
FFFFFF")
90 M=1 :: N=40
100 FOR Y=1 TO 4
110 FOR X=M TO N
120 CALL TCOLOR(256-X,1)
125 !USE CTRL A IN LINE 130,
180 QUOTES
126 !LINE 130 ...0+X-A): "CTR
L A";
127 !LINE 180 ...X-240): "CTR
L A";
130 DISPLAY AT(6+Y,0+X-A): "
";
```

```
140 NEXT X
150 A=A-40 :: M=M+40 :: N=N+4
0
155 NEXT Y
160 FOR X=241 TO 256
170 CALL TCOLOR(256-X,1)
180 DISPLAY AT(11,X-240): " ";
190 NEXT X
200 END
```

MY-BASIC ASCII CHART

I hope all of you read Jerry Stern's fine, no, excellent article in April's issue on Programming with Tokens. As I scanned his demo program I determined that it would probably run in MY-BASIC. The two CALL LOADs have no effect because

sprites are not defined to those memory locations, or you can load the program REDEFINE ASCII from the September 1990 MY-BASIC article then run MY-MENU from the June 1990 article and select D/V 163 file created per Jerry's article of MYBASIC commands and view it on the screen, which will show you the tokens, but Jerry's list is for TIXB, which leads me to this offer. Those of you that would like a comprehensive MY-BASIC ASCII CHART with tokens and the new MY-BASIC commands can send a self-addressed stamped #10 envelope to: DDI Software 2004 Leeann Austin, TX. 78758-2504.

DESCRIPT—

(Continued from Page 30)

Line 210 separates the data file into individual bits of information used for the deciphering process.

Line 220 sets the screen to the selected colors.

Lines 230-240 print the file name and color names to the printer (if selected.) This is where the overlap of boolean and file numbers occurs. The IF DD statment means IF DD is TRUE. If the printer was selected then DD=1 and DD is true. Otherwise DD=0 (FALSE) and the data is printed to file #0 (the screen) in the rest of the program lines.

Lines 250-860 are routines used to print the individual parameters.

Line 440 plays the sound.

Line 450 returns the print head and closes file #1 if the printer is selected.

Line 460 allows you to end the program by pressing Enter. If you want to examine another file just press the I key and you can do it one more time.

Line 470 is the END statment. If you want to run MENU or boot from your Horizon RAMdisk, you can replace this with DELETE "MENU" or DELETE "BOOT".

Lines 480-870 are subroutines used in the program.

If you choose not to have sound, just REM lines 110 and 440. If you use the SEB module, REM line 110 and change line 440 to :

```
440 IF A$(22)=CHR$(0) THEN CALL
CHIMES ELSE CALL BEEP
```

To make the hybrid XB/AL code, type in the second XB program listed. Run it to make a DF 80 file named "TONE/O". After you type in and debug the main program (with lines 110 and 440 REM'ed until you are ready to add the AL code), save the program in MERGE format as DESCRIPTM. Type these instructions from the command line in XB to complete the program.

```
CALL INIT
CALL LOAD("DSK1.TONE/O")
CALL LOAD("DSK1.ALSAVE")
CALL LINK("SAVE")
MERGE DSK1.DESCRIPTM
SAVE DSK1.DESCRIP
```

DESCRIPT

```
100 REM COPYRIGHT MAY 28,199
1 :: JOHN CREVISTON !196
110 CALL INIT :: CALL LOAD(8
196,63,248):: CALL LOAD(1637
6,65,76,83,65,86,69,255,48):
: CALL LINK("ALSAVE")!146
120 PD$="PIO" !040
130 DISPLAY ERASE ALL :: CAL
L SCREEN(5):: FOR X=0 TO 14
:: CALL COLOR(X,16,1):: NEXT
X :: PRINT " FAST-TERM P
ARAMETER FILE DESCRIPT
OR PROGRAM" !008
140 PRINT : " OUTPUT TO PRIN
TER (Y/N)" !176
150 CALL KEY(3,K,S):: IF S=0
THEN 150 :: IF K=89 THEN DD
=1 ELSE DD=0 !215
160 IF DD THEN PRINT : "PRINT
ER DEVICE NAME":PD$ :: ON ER
ROR 140 :: ACCEPT AT(23,1)SI
ZE(-28):PD$ :: OPEN #1:PD$ !
063
170 DIM A$(22)!138
180 PRINT "<-----
----->": "ENTER PARAME
TER FILE NAME- EXAMPLE; DSK
1.HOSTNAME" :: INPUT N$ !168
190 ON ERROR 870 :: OPEN #2:
N$,INPUT :: LINPUT #2:B$ ::
CLOSE #2 !080
200 IF LEN(B$)<>22 THEN PRIN
T "FILE NOT COMPATABLE OR" :
: GOTO 870 !038
210 FOR D=1 TO 22 :: A$(D)=S
EG$(B$,D,1):: NEXT D !104
220 CALL SCREEN(ASC(A$(14))+
1):: Y=ASC(A$(13))/16+1 :: F
OR X=1 TO 14 :: CALL COLOR(X
,Y,1):: NEXT X !134
230 IF DD THEN PRINT #1:CHR$(
13)&N$ :: PRINT #1:"SCREEN
COLOR IS ";:: ON ASC(A$(14))
+1 GOSUB 710,720,730,740,750
,760,770,780,790,800,810,820
,830,840,850,860 !031
240 IF DD THEN PRINT #1:"CHA
RACTER COLOR IS ";:: ON Y GO
SUB 710,720,730,740,750,760,
770,780,790,800,810,820,830,
840,850,860 !222
250 PRINT #DD:"MODEM PORT IS
";:: ON (ASC(A$(2))+1)GOS
UB 590,600,610,620 !239
260 PRINT #DD:"MODEM BAUD IS
";:: ON ASC(A$(1))+1 GOSU
B 480,490,500,510,520,530,54
0,550 !240
270 PRINT #DD:"MODEM PARITY
IS ";:: ON ASC(A$(3))+1 GOSU
B 560,570,580 !147
280 PRINT #DD:"PRINTER PORT
IS ";:: ON ASC(A$(5))+1 GOSU
B 590,600,610,620,630,640,65
0,660,670,680,690,700 !175
290 IF A$(5)>CHR$(3)THEN GOT
O 320 !147
300 PRINT #DD:"PRINTER BAUD
IS ";:: ON ASC(A$(4))+1 GOSU
B 480,490,500,510,520,530,54
0,550 !101
310 PRINT #DD:"PRINTER PARIT
Y IS ";:: ON ASC(A$(6))+1 GO
SUB 560,570,580 !074
320 PRINT #DD:"DUPLEX IS
";:: IF A$(7)=CHR$(0)THEN
PRINT #DD:"FULL" ELSE IF A$(
7)=CHR$(1)THEN PRINT #DD:"H
ALF" !099
330 PRINT #DD:"SPOOLER IS
";:: IF A$(9)=CHR$(0)THEN
PRINT #DD:"OFF" ELSE IF A$(
9)=CHR$(1)THEN PRINT #DD:"ON
" !192
340 PRINT #DD:"SCREEN WRAP I
S ";:: IF A$(10)=CHR$(0)THE
N PRINT #DD:"40" ELSE IF A$(
10)=CHR$(1)THEN PRINT #DD:"8
0" !219
350 PRINT #DD:"A LINE FEED W
ILL ";:: IF A$(15)=CHR$(0)TH
EN PRINT #DD:"NOT ";!175
360 PRINT #DD:"BE SENT" !133
370 PRINT #DD:"THE SCREEN WI
LL WINDOW";:: PRINT #DD:ASC(
A$(12));:: PRINT #DD:"CHARAC
TERS" !213
380 PRINT #DD:"STOP CHARACTE
R IS ";:: IF A$(16)>CHR$(32)
THEN PRINT #DD:A$(16)ELSE PR
INT #DD:"CHR$";ASC(A$(16))!0
25
390 PRINT #DD:"START CHARACT
ER IS ";:: IF A$(17)>CHR$(32
)THEN PRINT #DD:A$(17)ELSE P
RINT #DD:"CHR$";ASC(A$(17))!
101
```

(See Page 32)

DESCRIP—

(Continued from Page 31)

```

400 PRINT #DD:"DELAY UNTIL R
EPEAT IS";:: PRINT #DD:ASC(A
$(18))*256+ASC(A$(19))!255
410 PRINT #DD:"DELAY BETWEEN
REPEAT IS";:: PRINT #DD:ASC
(A$(20))*256+ASC(A$(21))!113
420 IF A$(22)=CHR$(0)THEN PR
INT #DD:"CHIMES HAVE";ELSE P
RINT #DD:"BELL HAS";!124
430 PRINT #DD:" BEEN SELECTE
D" !078
440 IF A$(22)=CHR$(0)THEN CA
LL LINK("CHIME")ELSE CALL LI
NK("BELL")!211
450 IF DD THEN PRINT #1:CHR$
(13):: CLOSE #1 :: PRINT "FI
NISHED" !197
460 CALL KEY(3,K,S):: IF S=0
THEN 460 :: IF K=49 THEN 13
0 !085
470 END !139
480 PRINT #DD:"110" :: RETUR
N !060
490 PRINT #DD:"300" :: RETUR
N !061
500 PRINT #DD:"600" :: RETUR
N !064
510 PRINT #DD:"1200" :: RETU
RN !110
520 PRINT #DD:"1200" :: RETU
RN !110
530 PRINT #DD:"4800" :: RETU
RN !119
540 PRINT #DD:"9600" :: RETU
RN !122
550 PRINT #DD:"19200" :: RET
URN !168
560 PRINT #DD:"EVEN" :: RETU
RN !217
570 PRINT #DD:"ODD" :: RETUR
N !129
580 PRINT #DD:"NONE" :: RETU
RN !219
590 PRINT #DD:"RS232/1" :: R
ETURN !074
600 PRINT #DD:"RS232/2" :: R
ETURN !075
610 PRINT #DD:"RS232/3" :: R
ETURN !076
620 PRINT #DD:"RS232/4" :: R
ETURN !077
630 PRINT #DD:"PIO/1" :: RET
URN !244
640 PRINT #DD:"PIO/2" :: RET
URN !245
650 PRINT #DD:"AXIOM INTERFA
CE (STANDARD)" :: RETURN !17
8
660 PRINT #DD:"AXIOM INTERFA
CE (MODIFIED)" :: RETURN !16
2
670 PRINT #DD:"CORCOMP PIO/1
" :: RETURN !047
680 PRINT #DD:"CORCOMP PIO/2
" :: RETURN !048
690 PRINT #DD:"MYARC PIO/1"
:: RETURN !150
700 PRINT #DD:"MYARC PIO/2"
:: RETURN !151
710 PRINT #DD:"TRANSPARENT"
:: RETURN !004
720 PRINT #DD:"BLACK" :: RET
URN !009
730 PRINT #DD:"MEDIUM GREEN"
:: RETURN !005
740 PRINT #DD:"LIGHT GREEN"
:: RETURN !187
750 PRINT #DD:"DARK BLUE" ::
RETURN !026
760 PRINT #DD:"LIGHT BLUE" :
: RETURN !113
770 PRINT #DD:"DARK RED" ::
RETURN !204
780 PRINT #DD:"CYAN" :: RETU
RN !214
790 PRINT #DD:"MEDIUM RED" :
: RETURN !109
800 PRINT #DD:"LIGHT RED" ::
RETURN !035
810 PRINT #DD:"DARK YELLOW"
:: RETURN !208
820 PRINT #DD:"LIGHT YELLOW"
:: RETURN !039
830 PRINT #DD:"DARK GREEN" :
: RETURN !100
840 PRINT #DD:"MAGENTA" :: R
ETURN !171
850 PRINT #DD:"GRAY" :: RETU
RN !222
860 PRINT #DD:"WHITE" :: RET
URN !045
870 PRINT "FILE NOT FOUND" :
: FOR X=1 TO 200 :: NEXT X :
: GOTO 130 !045
SPLAY ,FIXED 80,OUTPUT !2
110 PRINT #1:"000CA A
0000B0100B0200B1000B0201C00C
2B0202B0008B1006B02007F370F
0001" !182
120 PRINT #1:"A0012B1000B020
1C004CB0202B0076B0420B2024B0
300B0000B020AB10007F35DF
0002" !060
130 PRINT #1:"A0028BC80AB83C
CBF820C0000B83FDBD820C0000B8
3CEB0300B0002BD8207F280F
0003" !008
140 PRINT #1:"A003EB83CEB83C
EB16FCB02E0B83E0B0460B006AB0
59FBBFDFBFFE3B01097F1E8F
0004" !181
150 PRINT #1:"A0054B8E01BA40
2BC501B90B6BD306B0391BB7D4B0
503B92B8BD504B05A77F278F
0005" !025
160 PRINT #1:"A006AB0493BB0D
6B0503B94B1BD706B0395BB2D8B0
705BCA02B96B3BD0067F265F
0006" !041
170 PRINT #1:"A0080B0397BE
1B0503B98B5BD204B0585B0390BB
6D3B0503B91B7BD4067F28CF
0007" !019
180 PRINT #1:"A0096B0392BB8D
5B0705BA402B93B0BD606B0394BB
1D7B0503B95B2BD8047F279F
0008" !028
190 PRINT #1:"A00ACB05C5B019
6BB3D0B0503B97B4BD106B0398BB
5D2B0703B9FBFBDF007F233F
0009" !089
200 PRINT #1:"A00C2B0387B049
0B0301B9F007FA69F
0010" !147
210 PRINT #1:"50002BELL 500
10CHIME 7FAF7F
0011" !116
220 PRINT #1:" 99/4 A
S
0012" !101
230 CLOSE #1 !151

```

TONE/XB

100 OPEN #1:"DSK1.TONE/O",DI

We're Fighting For Your Life.

American Heart
Association

Ti Image Maker

80-column display from a TI console

By HARRY BRASHEAR

As a TIER for some eight years, I can tell you that my most sought after goal in the early years was to have 80 columns of text on my screen. Though I didn't jump on the bandwagon right away, Mechatronics of Germany was the first to satisfy that need, then the Digit card out of California and, of course, the 9640. For one reason or another, all of those products fell a bit short, so they just weren't for everybody.

A little less than two years ago three events came together at just the right moment. A Mechatronics device became available to me at a good price, Barry Boone had just finished a new EPROM that would cure a lot of problems with the Mechatronics device and, lastly, Funnelweb suddenly became available in an 80-column version. Let me tell you, when I finally got my Mechatronics up and running, it was one of the happiest days of my TI life.

During the course of the past year, there was a story that the Mechatronics would rise from the ashes and be made available again through Asgard Software. It wasn't just a story; there was a great deal of time, money and sweat put into the project. (Asgard began shipping its Extended Graphics Interface in May. — Ed.)

The reality is that Gary Bowser of OPA (Oasis Pensive Abucators) in Toronto got a better idea, one that would work for everybody; TIM!

THE TIM PACKAGE

TIM (Ti Image Maker) comes with two boards, two disks of 80-column software, and a set of explicit docs on how to put it into the console. Yes, I said, it installs right into your console, very easily. That's better than a side car (Mechatronics) and better than taking up a slot in your P-Box (Digit). Not only that, it's later and greater technology because TIM uses the 9958 VDP as opposed to the 9938.

TIM comes as two small boards: one to replace the 9918 VDP and a smaller one to replace two of the GROMs in the console.

Review

Report Card

| | |
|---------------------|---|
| Performance | A |
| Ease of Use..... | A |
| Documentation | A |
| Value | A |
| Final Grade..... | A |

Cost: \$179

Manufacturer: Oasis Pensive Abucators, 432 Jarvis St., Suite 502, Toronto, Ontario Canada M4Y-2H3; (416)960-0925; BBS (416)921-2731

Requirements: TI99/4A

To do the job, you need a small screwdriver to pop the old chips out, a soldering iron and an inch of solder. There are only two connections to make: one to the ground trace on the edge of the motherboard and one to another connecting point that is easy to locate on the back of the motherboard. Believe me, you don't have to be an electronics wiz to install this thing, anybody can do it.

The only hard part is taking a slice out of the back of the console case to allow for the 25-pin video connector. You need a good razor saw or equivalent, and you want to make it as accurate as possible.

Take note, once TIM is installed you do not replace the top shielding over the motherboard. I realize there have been wild stories about what would happen if this shield is removed, (i.e. the console may be used as a micro-wave oven, or, 747s will land on your roof, or, cable TV will be curtailed for ten square miles) but I found this just wasn't so. I haven't suffered a lot of RF interference in my monitor at all.

WHAT ABOUT A MONITOR?

There's no doubt, to get the most out of your new 80-column card, you should run out and buy a new one (if you don't already

own an analog RGB monitor). I would recommend one of the Magnavox wonders that support RGB, TTL, and composite, all in the same unit. Buying one of these sets you up for life, (also computer life after TI if you ever move to a PC). The cost of the Magnavox ranges from \$269 to a shade over \$300 and can be had from any number of places, including Tex-Comp. (Let's try to keep the \$\$\$\$ in the community, folks.)

If you want to stave off the monitor cost for a while, which I can't blame you for, then OPA is also selling an adapter that can be plugged into the middle of the video line. It's a little box selling for \$25 American that simply converts the signal from RGB to composite. I haven't seen this work, but Gary says it looks pretty good.

WHAT ABOUT SOFTWARE?

Since 80 columns has been in the forefront of most software minds for a couple of years, you are pretty much set for everything you will need.

Funnelweb offers 80-column options for the text editor, the disk manager and the assembly editor.

TI Multiplan in 80 columns is available from various networks.

Sector One, an excellent sector editor, has been set up just for 80 columns.

GIF picture viewers are available as fairware from Germany and also a commercial version Barry Boone.

HIX is a CALL LINK set that allows you to program all the best features of 80 columns.

John Johnson's MENU for the Horizon RAMdisk converts to 80 columns by pressing "W" at the menu.

YAPP V. 1.1, the latest upgrade from Asgard, will give all the artist ability you'll ever need for 80 columns, including the ability to work with GIF pictures.

Many of the new programs coming from Asgard already have 80-column capability, some are being upgraded to 80 columns, and there are programs coming

(See Page 34)

TI IMAGE MAKER—

(Continued from Page 33)
that will knock your sox off.

Everything that worked on your TI before, still looks the same through TIM. Standard TI is the default, 80-column mode is created from the software that uses it.

To date, only two pieces of software have presented a problem to TIM: there are two screens in Forth that require updating and the Qbert cartridge doesn't show up at all. (Darn! I was planning on playing Qbert sometime this year!)

THE NEW FRONT END

When you power-up with TIM you no longer get the TI screen that presents your options — TI BASIC and whatever cartridge you have in the slot. You now get an 80-column screen called the OPA Micro Manager. This built in program looks for your drives and your options. The drives you have appear in a box on the left, (this includes all drives set up via RAMdisks) and the cartridge options on the right. Pressing the space bar takes you from one box to the other. Pressing the arrow keys highlights whatever option you want, or one of your drives. If the drive is highlighted you get the directory of the disk presented on the right, selection of a program will run it.

Not only will you be able to run XBASIC and E/A option 5 programs but, remarkably, E/A option 3 as well. WOW!

OPA has some far-reaching ideas for this front end. At some future date, (I

heard Gary say "after they sell a thousand of them — which shouldn't be long) they are going to kill TI BASIC and turn this into a full fledged DOS system. Sounds interesting!

THE PROBLEMS

There are a couple of problems with TIM that will have to be experienced by a few people so that we can come up with some ideal answers. For the moment, here are my solutions, never the best!

Both the cards fell out of their sockets as I carried the finished console between my work bench and my computer desk. There are a couple of small components on the underside of the card that prevents a really good seating of the VDP card into the socket. My answer was to do some very minor pin bending on the card to give it a better grip. That wasn't a good solution, but it worked.

Another problem that sort of goes hand in hand with the above is the 25-pin connector on the back of the card. When you plug into it I guarantee you'll push the card right up and out of the socket. The solution is to make the slice you take out of the console as tight as possible. Also, plug the monitor cable into the card BEFORE you close the console. Make sure you get a good connector that screws to the mate on both sides. Actually, as an afterthought, it might be a smart idea to make up a six-inch pigtail connector for the board, then you'll never have to directly connect to it again.

I don't see any good way around the

mentioned problem. It isn't OI fault and creating a hardware solution is only going to run up the cost of the card. I think as long as you know what's going to happen, you can prepare yourself, but OPA doesn't mention it in the docs.

MY OPINION

You know me, when I like something, I REALLY like it. Such is the case with TIM. I no longer have to contend with the side car, extra power supply, and possible connection loss of the Mechatronics 80-column device. If it's any recommendation, I sold my Mechatronics two weeks into owning my TIM. (I sold it with good conscience too, that is still a fine piece of hardware.)

The TIM has advantages now, and a heck of a lot of potential for the future. The 25-pin video connector was used on TIM so that future hardware products would have easy access to the 9958. The EPROM GROM replacement will also give access to great new software, like a line command DOS.

It's well made, with forethought, the docs are good, the installation is easy and you can plug n play in short order.

BUY IT! The cost is a flat \$179 (U.S. funds or Canadian) and has a full year guarantee against product failure.

This product can also be obtained from OPA, or Bud Mills Services, 166 Dartmouth Drive, Toledo Ohio, 43614.

Newsbytes

Texaments releases TI Artist Plus! Pak

Texaments has released the TI Artist Plus! Pak, a combination package of five programs for TI-Artist and TI Artist Plus! users.

As well, Texaments now buys, sells and trades used TI99/4A and Geneve 9640 hardware, software, resource materials and accessories directly with end users, according to Steve Lamberti, president of Texaments.

Also, prices on all Character Sets and

Graphic Design (CSGD) have been reduced.

The TI Artist Plus! Pak consists of five software packages — GuideLines, Display Master, Artoons, Designer Labels and the Artist's Companion of choice (Nos. 2 through 13; Artist Companion No. 1 is excluded from this offer) — at \$49.95. Purchased separately, the same software would cost almost \$60, Lamberti says.

New reduced CSGD software prices are: CSGD I (The Beginning), \$9.95; CSGD II (The Banner Maker), \$7.95; CSGD III (The Continuation), \$12.95; CSGD User Disk 1, \$2.95; CSGD User

Disks 2 through 7, \$5.95 each; CSGD Cataloger, \$3.95. In addition, any two CSGD User Disks can be purchased for only \$10.90 and any three for \$15. The entire CSGD Software Series, consisting of all the CSGD programs and User Disks, which originally sold for more than \$127, can be purchased for \$65.

For further information, or to order, contact Texaments at 53 Center St., Patchogue, NY 11772 or call (516) 475-3480 (voice) or (516) 475-6463 (BBS). Mail orders should include an additional \$3.25 for U.S. and Canadian shipment and (See Page 35)

Newsbytes

(Continued from page 34)

\$8 for foreign shipment.

A free spring/summer catalog will be provided on request to the above address or by voice or modem phone request, Lamberti says.

Unless otherwise noted, all used hardware purchased from Texaments is guaranteed to be in good working condition and comes with a 30-day warranty, Lamberti says. In addition, the company also has a 15-day refund policy for all used hardware. All non-defective returns are subject to a 20 percent restocking fee; all shipping costs are the responsibility of the customer.

Texaments also offers a free, no obligation quotation service to persons wishing to sell all or part of their current TI99/4A or Geneve 9640 system. To take advantage of this service individuals should mail in a listing of the equipment they wish to sell. Within two business days, the company will send a formal offer to those requesting quotation.

The program is available only within the United States and Canada. Availability of items offered for sale is limited and items are sold on a first come, first served basis.

Individuals who wish to obtain a free listing of used TI hardware, software, resource materials and accessories available from Texaments should send a self-addressed, postage-paid envelope to Texaments, at the address above or call the BBS.

Complete instructions for placing an order or requesting a quotation are included in both the printed and on-line equipment listings, Lamberti says.

OPA to produce RICH GKXB cartridge

Oasis Pensive Abacutors will produce

the RICH GKXB cartridge, according to program author Richard Gilbertson (see April 1991 MICROpendium). Gilbertson says the cartridge version is expected to be available in December.

He says he has added several enhancements to the program, including a MOVE command which allows the user to edit programs while they are running rather than using a MERGE file.

"It's user-friendly and sophisticated," he says.

The user can move from RAM to VDP, VDP to GRAM, RAM to GRAM, etc., he notes.

The program will be compatible with the TI-Image Maker (Tiny-TIM) or a VDP card. The user will be able to change VDP mode and go to bitmap graphics and switch back.

Gilbertson says he is working on PEEK LINE and PEEK STRING commands, which search for line numbers and strings, respectively. He notes that Gary Bowser of OPA is setting up the program so it could run with CD ROM if that becomes available.

The input/output working with the CRU address of the machine is on a machine language level, with the same control as assembly language. When this is completed, the user can use it for playing music, Gilbertson says. He notes that the new utilities are "mostly for people who are good at programming," and he predicts "lots of future software" resulting from them.

The cartridge version will run with a standard TI99/4A, he notes. A disk version which will work with a GRAM device or the Geneve 9640 is now available from CaDD Electronics. Gilbertson says, however, that some system lockup problems exist with the Geneve.

OPA is at 432 Jarvis St., Ste. 502,

Toronto, Ontario, Canada, M4Y 2H3, (416) 960-0925 (8 a.m.-11 p.m. EST, voice) or (416) 921-2731 (24-hour BBS).

CaDD Electronics has announced that it is selling the RICH GKXB disk for \$24.95 plus \$2 for shipping and handling, according to Mark Van Coppenolle of CaDD.

A demo is included on the disk with the GRAM files, and the price includes includes a manual of approximately 90 pages, Van Coppenolle says.

For further information or to order, contact CaDD Electronics, 81 Prescott Rd., Raymond, NH 03077 or call (603) 895-0119.

Gilberston says he is working with programmer Quinton Tormanen on a disk manager. He notes that "the RAM disks are the snag on a disk manager. None of them works exactly the same."

He says he is looking for a book entitled GPL Access to Disk Drives or GPL Control of Disk Drives.

"If I had that, I could put the disk manager in the (XB) cartridge Gary's working on," he notes.

Gilbertson's address is 2205 S.E. Salmon, Portland, OR 97214.

Convention gets site

The pool room near the Tacoma Mall, Tacoma, Washington, has been reserved as the site for the TI convention scheduled the weekend of Sept. 21, according to Barbara Wiederhold, one of the organizers.

Exhibitors wishing to reserve booth space may call (206) 546-1205 and leave a message.

Want to reach thousands of TI users without paying a dime? Send information about your products and services to MICROpendium Newsbytes, P.O. Box 1343, Round Rock, TX 78680.

LIMA FAIR—

(Continued from Page 19)

Proposed of elementary school students. The presentation includes suggestions on getting computers into schools.

- Mike Wright with bits and pieces of TI history, including a demo of the 99/2

computer.

- Beery Miller with software from 9640 News.

- Charles Good with a preview of Funnelweb v4.32 with support for DSKU file comments.

- Bruce Harrison, demo of Golf Score Analyzer, Harrison Word Processor and classical music disks.

- Barry Traver, presentations on programs that write other assembly and Extended (See Page 36)

Creating queries on the fly

By **BILL GASKILL**
©1991 B. Gaskill

Although we are skipping around a little as far as the order of the menu for the MICROPEN application is concerned, I thought you would enjoy this particular feature. Thus I have decided to cover it now rather than wait until we got down to option Q.

Any TI-Base user knows that you can create queries from the dot prompt and you can create them in the command file editor as part of a command file. What you may not have realized is that TI-Base will also allow you to create custom query definitions that can be created within a running program and then executed with a single keypress. With some limitations, the definition created is also saved for the next time that you want to use it.

The command file named QUERY that is listed below shows how the job is done. (See Fig. 1.)

When the command file first opens it prompts you for a single Y/N keypress (compliments of V3.0's new READCHAR

LIMA FAIR—

(Continued from Page 35)

BASIC programs, including his "GRAPHICOMP" from MICROpendium; and on his Genial TRAVELER diskazine and the GENIE TI SIG.

- Chris Bobbitt, demos of Screen Preview, Link, Classic Checkers, Video Tracker, Line Editor, SWG CHAR Set Editor from Asgard Software, and presentation on Asgard Software support for Page Pro 99.

- Bud Mills, on-screen demos of Memex Memory Expansion, P-GRAM and the Horizon RAMdisk.

- Joe Ross, demo of c-Sheli 99.

- E.M. Smith of the K-Town 99/4A Users Group, 3506 Garden Dr., Knoxville, TN 37918, demo of Art Gibson's Newsletter Printer software.

- Videos of displays in the fairs exhibit area, with interviews by Mel Nomina of the Lima Users Group.

directive) to allow you to bail out of the Query definition process if desired. V2.0 owners will have to change READCHAR to READSTRING. If you press N or n the main system menu will return. A Y or y keypress will continue the Query definition process. As you can see, READCHAR is not case sensitive and thus will read either upper or lower case. A nice touch. Thanks, Dennis!

Assuming that a Y or y was pressed the command file editor is invoked and the screen goes blank. At that point you are creating a second command file named QN (for Query Now) that will do your bidding as far as searches, sorts, displays, printing et cetera. Virtually any operation that can be stuffed into a 50-line command file can be created.

When you are satisfied with the Query that you have created simply press Fctn 8 to execute it or Fctn 9 twice to escape from it. The reason that you must press Fctn 9 twice is because you are running a command file from within the command file editor. The first Fctn 9 keypress aborts the QN command file query and the second escapes from the command file editor and the QUERY command file that started the whole process. The end result is that the menu is redisplayed.

Whatever query definition that was created will be saved as QN/C on your data

disk. That same definition will appear the next time that you access the Query Editor. Thus you can save a query definition for future use.

If you wish to save it outside of the Query Editor you can easily do so by copying QN/C to another file name. That will make a clone of the QN/C file. To reuse it, COPY it back from whatever name you originally COPYed it to, to QN/C. If you try to use the Query Editor to do the job though, you will get an error message that tells you the "file does not exist". This is because you are trying to copy a file that is in use. Neither TI-Base nor any other application that I am aware of will let you do that. So you will need to drop to the dot prompt to get the COPY done. However,

```
* query 06/01/90
LOCAL QN C 8
CLEAR
SET INVERSE ON
WRITE 04,13 "^^^^^^^^^^^^^^^^^^"
WRITE 05,13 " QUERY EDITOR "
WRITE 06,13 "^^^^^^^^^^^^^^^^^^"
SET INVERSE OFF
WRITE 10,05 "CREATE A NEW QUERY? Y/N:"
READCHAR 10,29 QN
IF QN="N"
RETURN
ELSE
ENDIF
MODIFY COMMAND QN
DO QN
RETURN
```

the Query Editor can certainly be used for CATALOGing, COPYing, FORMATting, LISTing et cetera of other files. Neat, huh?

Have you been to a TI Fair lately?
See the listing on Page 5 for this year's schedule of events
To find out what you're missing,
see the report on the Lima fair on Page 19

User Notes

Days of the week

This comes from Larry Tippett of Model City, New York. He writes:

This is a short program I found in a newsletter from the Western New York 99ers. It's a routine to locate the day of the week of any particular date. I found it to be quite accurate despite its simplicity.

The only thing that needs clarification is that when you enter the date, use only digits separated by commas, with the year being a 4-digit number (06,05,1991). Entering in any other way will induce an error.

```

90 !SAVE DSK1.DAY/WEEK !076
110 CALL CLEAR !209
120 INPUT "ENTER MM,DD,YYYY:
":M,D,Y !037
130 A=Y-(INT(Y/28)*28):: B=A
/4 :: E=A-INT(B)*4 !085
140 C$="511462403513" :: IF
E=0 THEN IF M<3 THEN C$="40"
!155
150 E=VAL(SEG$(C$,M,1)):: IF
E=1900 THEN A=A+12 !243
160 G=A+INT(B)+D+E :: F=G-(I
NT(G/7)*7)!150
170 DATA SUN,MON,TUES,WEDNES
,THURS,FRI,SATUR !071
180 RESTORE :: FOR B=0 TO F
:: READ C$ :: NEXT B !108
190 PRINT "TODAY IS ";C$;"DA
Y" !064
200 PRINT !156
210 INPUT "DO ANOTHER? (Y/N)
":YN$ !144
220 IF YN$="Y" OR YN$="Y" TH
EN GOTO 110 !031

```

Multiplan comparisons

This item, by Garth Potts, appeared in the newsletter of the Sooner 99ers. It compares Multiplan operations in four configurations: the original version on a TI99/4A working out of a RAMdisk, TI Multiplan 4.0 on a 99/4A, the 80-column version of Multiplan on a Geneve and Multiplan on IBM-PC.

The worksheet I ran stretches the TI version of Multiplan to its memory limits. It is 63 sectors long, has 236 formulae spread across 1360 cells (80 rows down by 17

columns across), and has 15 Named cells. My original version of Multiplan resides on a 512K Horizon RAMdisk, which obviously reduces the loading time of the program dramatically. The IBM version was run on an AT-class machine with 512K of RAM and a 30-megabyte hard drive.

See the accompanying chart to compare performance results.

*Geneve requires loading of MDOS and TIMP module (saved to disk) — 1:03:48.

What did I learn from this exercise?

1. The 4.0 TI version is outstanding in its ability to reduce recalculation times by almost 50 percent.

2. Recalculation times are halved by the Geneve version, but that advantage is lost by the unbearably slow file saving function. (This file saving time is reduced when running out of a hard disk—Ed.)

My conclusion is that Multiplan for the TI, however arcane for any computer, fits my bill very nicely, thank you. It does what I need done and I'll happily continue using it. The Geneve setup is a bonus for me compared to last year's TI-version. The new 4.0 version, however, is an outstanding upgrade that is worth every penny. (TI Multiplan V. 4.0 is available from its author, Art Green of RAG Software at 1032 Chantenay Dr., Gloucester, Ontario, Canada K1C 2K9. The cost is \$10.

192K video memory for the Geneve

The following is by Garry Christensen of Deception Bay, Queensland, Australia. In its standard configuration, the 9938 video chip uses 128K of memory to display

images on the screen. The designers did however make provision for adding an additional 64K to bring the total to 192K. The AVPC and the Mechatronics 80 column card can make use of the expansion memory however the 9640 uses the 128K configuration and no provision has been made

MULTIPLAN PERFORMANCE COMPARISONS

| FUNCTION | TIMP Orig. RAMdisk | TIMP TIMP 4.0 | Geneve | IBM Multiplan |
|------------------|-----------------------|------------------|----------|------------------|
| Program Loading | 00:05:13* | 00:20:32 | 00:20:58 | 00:11:34 |
| Loading Datafile | 00:30:76 | 00:27:18 | 00:20:40 | 00:09:67 |
| % Memory Unused | 2 % | 2 % | 63 % | 94 % |
| Recalc Time | 01:48:76 | 00:58:21 | 00:29:76 | 00:02:23 |
| File Save Time | 01:19:63 | 01:15:53 | 03:38:76 | 00:23:80 |

Times are in minutes, seconds, and hundredths of a second.

for the addition of the extra RAM.

Till recently, this has been no great problem because there was no software written that could make use of the expansion memory but now some programs are appearing. While no sockets or positions are provided on the 9640 circuit board, it is not difficult to add the extra 64K. The following is a brief description of the method.

NOTE: The author accepts no responsibility for damage that may occur during or after installation of the memory however the author has been using this modification for some time and has experienced no problems.

You need:

2 64K DRAM chips

2 short lengths of fine insulated wire

A fine tipped soldering iron

A small screwdriver or IC removing tool

Some soldering experience

1. Remove the 9640 from the PEB and remove the cover. Orientate the circuit board so that the component side is uppermost and the edge contacts are closest to you.

2. In the centre right of the board you will locate the 9938 video chip with a silver oscillator and 4 chips beneath it. (Refer to

(See Page 38)

User Notes

(Continued from Page 37)

the diagram below)

3. Gently remove the 9938 chip, being careful not to damage the pins. Hopefully all 9640 will be alike in that the video chip is socketed. Bend out pin 59 of the video chip and re-insert.

4. Bend out pin 16 of each of the additional RAM chips and piggy-back them onto two of the VRAM chips on the board. If your VRAM chips are socketed it will be easier to remove the chip before adding the extra chip to it.

The RAM chips are used in pairs. The top and bottom chip are a pair, as are the middle two. You must install the extra chips onto a pair. Use the end two or the middle two.

5. Connect a wire from pin 59 of the video chip to pin 16 of the first XRAM chip, and a wire from there to pin 16 of the

second chip. (Refer to the diagram)

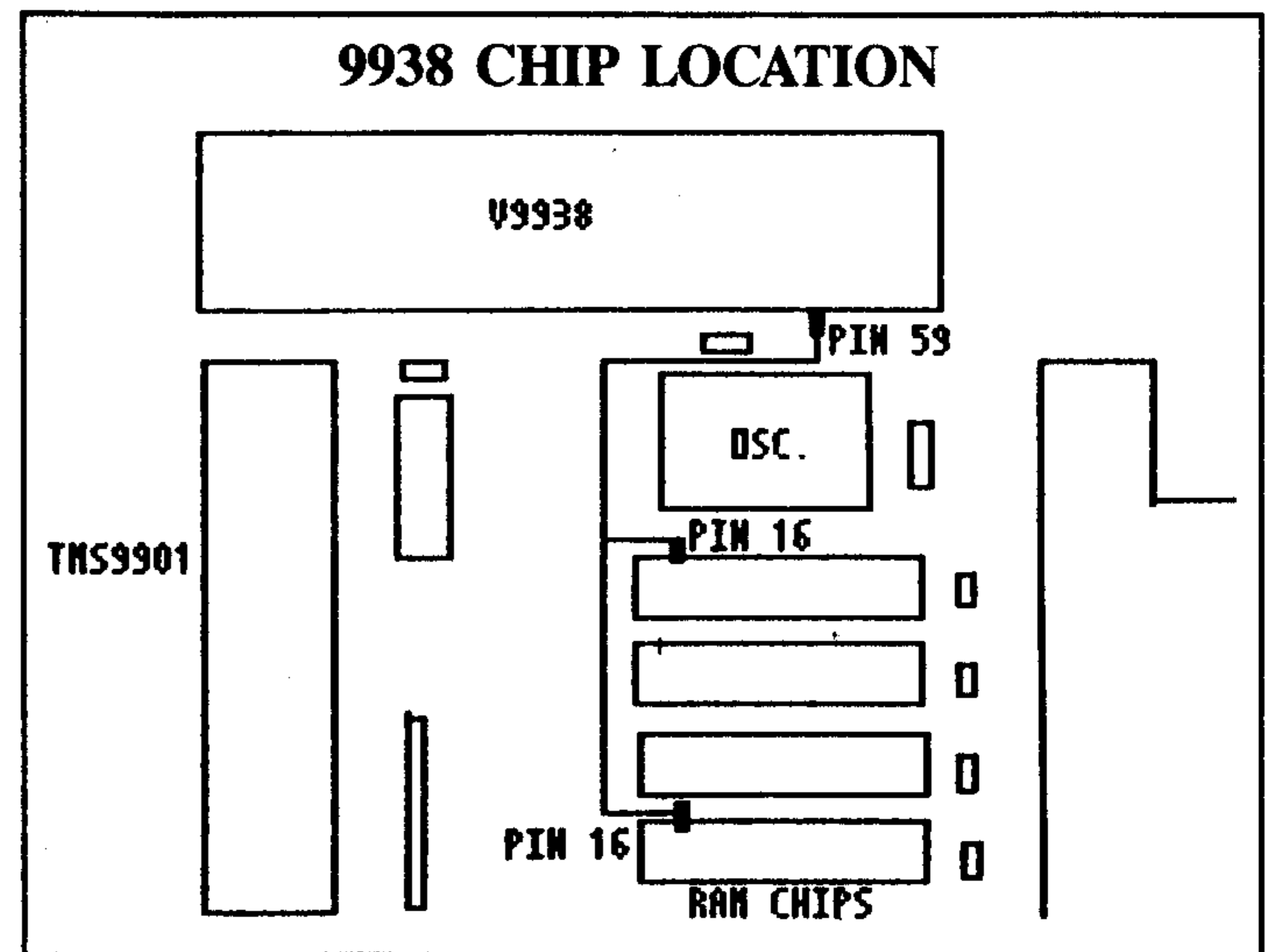
6. Double check your work to ensure that adjacent pins have not been bridged with solder, the wire connections are secure and that no pins have folded under the chip when it was re-inserted into the socket.

7. Replace the case and install the 9640 in the PEB. Power up the computer and a normal screen (the swan) should be displayed.

Installation complete.

In normal oper-

ation you will notice no difference in the display. This extra memory can only be accessed by programs that were written to do so.



MICROpendium disks, etc.

- Series 1991-1992 (mailed monthly April 1991-March 1992) \$40.00
- Series 1990-1991 (April 1990-March 1991, 6 disks) \$25.00
- Series 1989-1990 (April 1989-March 1991, 6 disks) \$25.00
- Series 1988-1989 (April 1988-March 1989, 6 disks) \$25.00
- MICROpendium Index (2 SSSD disks, XB req.) \$6.00
- MICROpendium Index II (7 SSSD disks—1 for each year, XB req.) \$21.00
- TI-Forth (2 disks, req. 32K, E/A, no documentation) \$6.00
- 1988 updates of TI-Writer, Multiplan & SBUG (2 disks) \$6.00
- Disk of programs from any issue of MICROpendium between April 1988 and present \$4.00

GENEVE DISKS

- MDOS 97h (req. SSDD or larger, used with MBASIC) \$4.00
- MDOS 1.14F (req. for MBASIC) \$4.00
- Myarc BASIC 2.99A \$4.00
- MY-Word V1.21 \$4.00
- Menu 80 (specify floppy or hard disk version(s), SETCOLOR, SHOWCOLOR, FIND, XUTILS, REMIND) \$4.00

(Unless specified, all disks are SSSD) Texas residents add 7.75% sales tax

GENEVE PUBLIC DOMAIN DISKS

(These disks consist of public domain programs available from bulletin boards. If ordering DSDD specify whether Myarc or CorComp.)

| | SSSD | DSDD |
|--|-------------|-------------|
| <input type="checkbox"/> Series 1..... | \$9.00..... | \$5.00..... |
| <input type="checkbox"/> Series 2..... | \$9.00..... | \$5.00..... |
| <input type="checkbox"/> Series 3..... | \$9.00..... | \$5.00..... |
| <input type="checkbox"/> Series 4..... | \$9.00..... | \$5.00..... |
| <input type="checkbox"/> Series 5..... | \$9.00..... | \$5.00..... |
| <input type="checkbox"/> Series 6..... | \$9.00..... | \$5.00..... |

3 New Geneve Disks!

Name _____

Address _____

City _____

State _____ ZIP _____

Check box for each item ordered and enter total amount here: _____

Check/MO Visa M/C
(Circle method of payment)

Credit _____

Card # _____

Exp. Date _____

Classified

SOFTWARE

TI-PD PUBLIC DOMAIN AND FAIRWARE

500 DISKS just \$1.50 EACH! And orders for 8 or more disks are postpaid.

Thousands of programs selected from the best from the U.S., Canada, Australia, England, Germany, Holland and Belgium. FAIRWARE IS OFFERED BY AUTHOR'S WRITTEN PERMISSION ONLY. Disks as full as possible, arranged by exact category, BASIC programs converted to X BASIC, assembly programs with X BASIC loader, disks with autoloader by full program name.

Send \$1.00 (deductible from first order) for 13-page catalog listing all programs and authors. Catalog also available on disk.

TIGERCUB SOFTWARE, 156 Collingwood Ave., Whitehall, OH 43213. v8/7

FOR SALE

ENORMOUS TI99/4A INVENTORY

Catalogs \$2.00. Braatzs Computer Services, 719 E. Byrd St. Appleton, WI 54911. 1-414-731-3478. 8/8

HARDWARE

TI EQUIPMENT

Too numerous to list. Includes consoles, P-Boxes, speech cards, including Horizon RAMdisks. Price dirt cheap: Example P-Box FULL \$200.00. Call (813)985-1048 after 6 p.m. EST. v8n5

Complete, never used TI99/4A system. Expansion box, console, 32K card, 80K GRAM Kracker, 2 disk drives, speech

Policy

The cost of classified advertising is 25 cents per word. Classified display (i.e., special formatting or graphics) is \$9 per column inch. Classified advertisements must be paid in advance. Classified advertisers may request a category under which they would like their advertisements to appear, but the final placement decision is the responsibility of the publisher.

Classified deadlines will be kept open for as long as practical. For the purpose of classified advertising deadlines, any classified ad received later than the first day of any month cannot be assured of placement in the next edition. We will do our best to include every advertisement that is submitted in the earliest possible edition.

The publisher offers no guarantee that any advertisement will be published in any particular issue. Any damages that result either from errors in copy or for failure to be included in any particular edition will be limited to the amount of the cost of the advertisement itself. The publisher reserves the right to reject any advertisement.

The advertiser may elect to publish the advertisement in subsequent editions at the same charge, payable prior to publication. The deadline for carryover classifieds is the same as for new advertising.

In submitting an ad, please indicate whether you would like a refund if it is not published in the requested edition or whether you would like us to hold it for the next edition. Cancellations and refunds cannot be made after the second day of the month.

Send classified advertising to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

HARDWARE

synthesizer, RS232 card, modem, disk controller card, TI Extended BASIC module, Disk Manager module, books and software too numerous to mention. \$450.00, or separately. Call 516-334-7427 or write to P.O. Box 106, Tazewell, TN 37879. v8n5

PEB COOLING FANS, QUIET cooling fans for your PEB. "TEXAS COOLERS" reduce the roar to just a whisper. They are ready to install with complete illustrated instructions. (See February '90 Newsbytes.) Money back guarantee. Supplies are limited. To order send check or money order for \$28.00 + \$3.50 (S&H) to: ALL-CARE +Computing, P.O. Box 922601, Sylmar, California 91392-2601. v8n6

BUDGET BARGAIN

Seldom used PEB with 32K RAM, 1 internal, full-height floppy disk drive, TI disk

MISCELLANEOUS

| | |
|--|-------|
| PASCAL COMPLETE SYSTEM | \$149 |
| TI RS232 CARD used | \$115 |
| FULL TI PE/BOX—RS232—32K—DRIVE | \$299 |
| EMPTY TI PE/BOX (used) | \$110 |
| 18" TI PE/BOX EXTENSION CABLE | \$25 |
| EDITOR/ASSEMBLER PACKG (new) | \$12 |
| SPEECH SYNTHESIZER used | \$35 |
| PARALLEL PRINTER CABLE 6' | \$19 |
| PE-BOX TECH TRAINING MANUAL | \$20 |
| TI ORIGINAL COLOR MONITOR | \$149 |
| SERVICE MANUAL (CONSOLE/P BOX) | \$25 |
| 4A FACTORY REPAIR MANUAL | \$20 |
| DISK CONTROLLER & 32K CARDS ea | \$95 |
| P-BOX "CARD" REPAIR MANUALS (ea) | \$10 |
| TI COLOR MONITOR SERVICE MANUAL | \$15 |
| SCHEMATICS/CARDS/CONSOL/PBOX ea | \$5 |
| CC40 (TI hand held computer) | \$55 |
| CC40 PERIPHERAL USER MANUALS | \$10 |
| USED TI99/4A, Hardware, Software, Books and Parts. Call or write for complete free list. S&H \$3 min | |
| JIM LESHAR, 722 HUNTLEY DALLAS, TEXAS 75214, 214 821 9274 | 8/5 |

controller. Used as backup system. No manuals. \$150, shipping included. Call 512-255-1512. v8/5

Want to sell your used, unwanted computer software and hardware but don't want to spend a lot of money on classified ads in magazines and newspapers?

Want to buy used software and hardware from others but don't know where to find it?

If you answered yes to both of the above questions then the National Used Software/Hardware Club may be for you. Buy used computer hardware and software or sell your unneeded computer hardware and software (Apple, Atari, Commodore, Macintosh, PC, TI, etc.). We act as middleman between buyer/seller and insure honest transactions. We guarantee that your buys and sells will be done to your satisfaction.

Annual membership (includes newsletter) is \$15/year. Use Visa/MC and call 800-777-6632 to expedite your membership. (Call 9-5 Central Time.) Or send #10 SASE to National Used Software/Hardware Club for FREE no-obligation information pack.

NUSHC, P.O. Box 1343, Round Rock, TX 78680 (Sorry, U.S. orders only.)

National Used Software/Hardware Club
800-777-6632 • 1-800-777-6632

The ONLY monthly devoted to the TI99/4A

Subscription Fees

\$25 for 12 issues via domestic second class mail
 \$30.25 (U.S. funds) Mexican delivery
 \$32.50 (U.S. funds) Canadian delivery
 \$30.00 (U.S. funds) for 12 issues other foreign delivery via surface mail
 \$42.00 (U.S. funds) for 12 issues other foreign delivery via air mail

Outside U.S., pay via postal or international money order or credit card; personal checks from non-U.S. banks will be returned

Address Changes

Subscribers who move may have the delivery of their most recent issue(s) delayed unless MICROpendium is notified six weeks in advance of address changes. Please include your old address as it appears on your mailing label when making an address change.

Back Issues

Back issues of MICROpendium are available to subscribers only. Those wishing back issues may notify us of the issue(s) desired and include \$2.50 per issue desired in a check or money order or by credit card. (Minimum credit card order is \$9.) No shipping charge in U.S. and Mexico; Texas residents add 7.75% sales tax. Shipping charge of 30 cents per issue to Canada. For other foreign delivery, add 50 cents per issue surface mail, \$2 per issue air mail. No discounts on orders of sets. All prices U.S. funds.

OUT OF STOCK: Vol 1, nos. 1-2, Vol 2, no. 1

Miscellany

TI-Forth Disks (2 disks, program and demo disks, no manual).....\$6.00
 MICROpendium Index (2-SSSD disks, XBASIC required).....\$6.00
 Disk of programs from one issue of MICROpendium (must be a subscriber to order).....\$4.00
 12 monthly disks (April 1990-March 1991) of programs appearing in each edition of MICROpendium (must be a subscriber to order).....\$40.00
 Magazine holders (12/set-add \$1 shipping/order).....\$3.00

Send name, address, product(s) ordered, check, money order or Visa/MasterCard number and expiration date (\$9 minimum on credit card orders \$9) to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680. (Foreign orders write for postage fees.)

Tell us about it

Please let us know what columns or features you like the most about MICROpendium. Rank your selections in order of preference using this form. Return it to us when you renew your subscription.

1. _____
2. _____
3. _____
4. _____

Other suggestions: _____

Send me the next 12 issues of MICROpendium. I am enclosing \$ _____ in a check or money order in U.S. funds. Or bill my (Check one)

Exp. Date _____

Card No. _____
Minimum credit card order is \$9

Signature _____
(required on credit card orders)

Mail to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680

Name _____

Address _____

City _____

State _____ ZIP _____

The numbers on the left of your mailing label indicates the cover date of the last issue on your subscription.

SECOND CLASS