BULK RATE
U.S. POSTAGE PD.
ROUND ROCK, TX

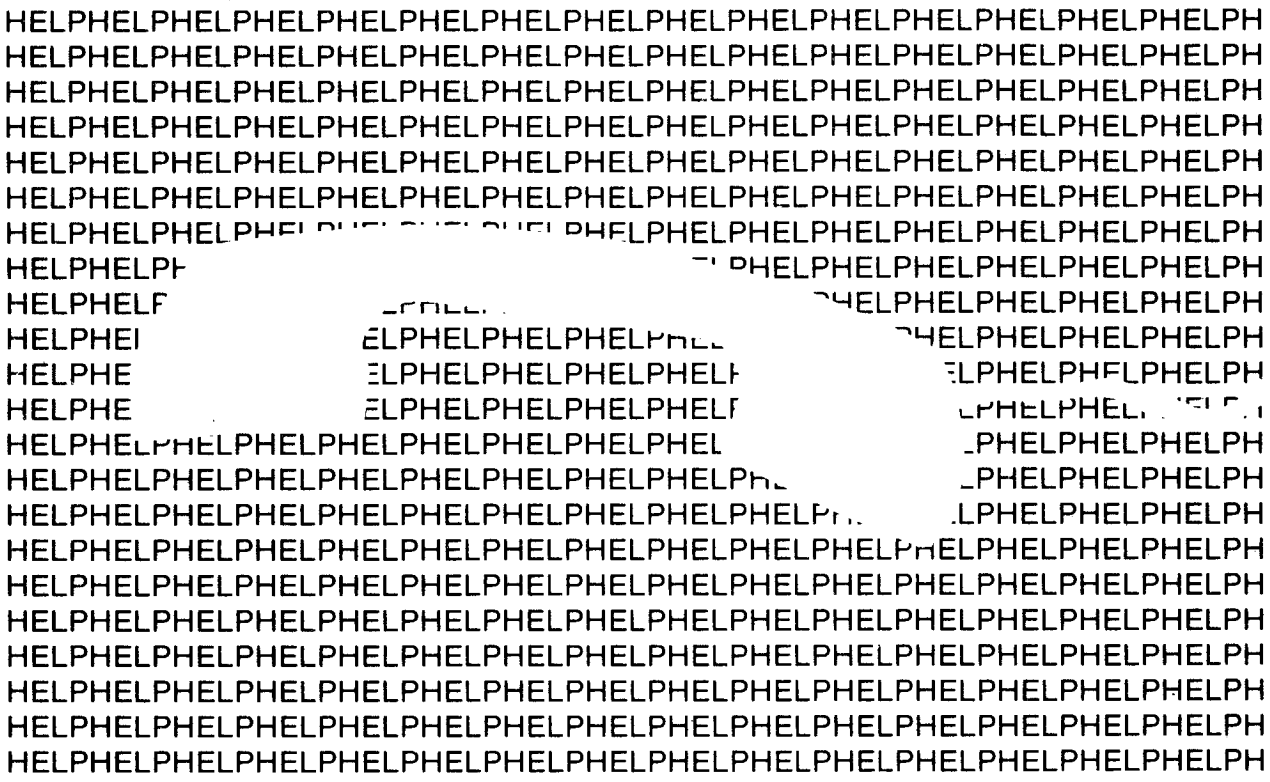
PERMIT NO. 533

P.O. Box 1343, Round Rock, TX 78680 Postmaster: Address Correction Requested

# MICROpendium

## Covering The TI99/4A Home Computer And Compatibles

Volume 1 Number 7 August 1984 $1.50



See Page 9

# Contents

MICROpendium

MICROpendium is published 12 times annually in Round Rock, Texas. No material published in the pages of MICROpendium may be used without permission of the publisher. Computer user groups that have signed 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 in 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-enclosed, stamped envelope is included.

All editions of MICROpendium are mailed from the Round Rock (Texas) Post Office. Subscriptions are $12 for 12 issues, delivered via third class mail. In Canada, add $3.50. Subscribers in the United States who wish first class delivery may also add $3.50 to the basic subscription price.

Mailing address: P.O. Box 1343, Round Rock, TX 78680
Telephone: (512) 255-1512
Source: TI4596
John Koloen ..... Publisher
Laura Burns ..... Editor

## Coming Next Month

**—Review of 99/4 Auto Spell-Check**
**—A feature on Wycove Forth**
**—Why some products gain wide distribution and others don't**

©Copyright MICROpendium

# Table of Contents

## A helpful guy

Looking for some free advice? You might want to call or write Dr. Guy Romano in California, who offers his services in 12 languages to TI users ..... Page 9

## All about copyrights

You can copyright your programs for $10, but nobody seems to know exactly what a copyright protects ..... Page 10

## Taking care of the equipment

There's such a thing as being too fastidious when it comes to cleaning disk drive heads ..... Page 11

## An 80-column card

Foundation Computing is about to release an 80-column card for the TI ..... Page 13

## Escape with TI-Writer

The manual doesn't go into great detail, but ASCII codes can be used to enhance your output ..... Page 14

## Reviews

TE-1200 ..... Page 15
Tower ..... Page 16
Galactic Battle ..... Page 17
Galaxy ..... Page 18

## User Notes

A file conversion routine, something to help pinpoint errors and a programming contest debuts ..... Page 20

## Newsbytes

Pascal users can find help in California and what are those rumors about Brazil ..... 22

## Classifieds ..... Page 23

## Comments

# Who is MICROpendium?

It would be nice if the staff of MICROpendium, both of us, were making a living at publishing the magazine. (Please, we're not asking for sympathy. If we didn't want to publish this periodical, we wouldn't.)

Making a living with MICROpendium is a goal for us, of course, but in the meantime we continue to hold full-time jobs. I'm referring to myself and the editor, Laura Burns. I am a news editor at a newspaper and Laura is an information specialist with an agency of the Texas state government.

So what does this have to do with anything? Not much, except as a way of moderating some of the blame we are open to when an issue gets mailed out a few days late. Or when we aren't able to get back to someone quickly enough when they've phoned or sent a letter. We produce MICROpendium often despite our real jobs and we do it because we enjoy it. So, the next time you feel we haven't quite measured up to your expectations, remember that we probably haven't measured up to our expectations, either.

### CONFLICT OF INTEREST?

Since my background is in newspapering, I find it difficult to ignore some of the things that go on in the world of computing, particularly in other periodicals. One item in particular caught my attention recently. If it weren't such a glaring problem I wouldn't bother to mention it. However....

The most recent edition of Enthusiast 99, which is circulated to members of the so-called International 99/4 Users Group, carried an article about an assembly language debugger. Nothing wrong in that. It was written by Terry Heim, whose byline identified him as the IUG's Staff Technical Writer. Nothing wrong in that, either. However, what is not mentioned in the article, which reports glowingly about the product, or elsewhere is that Terry Heim is also marketing the program, called Bugout, through his company, The Data Process. In other words, Mr. Heim has a financial interest in the success of the product of which he writes. In the newspaper world, this constitutes the appearance of a conflict of interest, at the least. Although there is nothing wrong with the vendor writing about his product, the reader should be told of this fact so that he can decide for himself how much weight to give to the writer's opinion of the product. IUG owes it to its members to be candid about such things.

### PIRATES OR EXTORTIONISTS?

Judging by the response from readers, MICROpendium will not be publishing programs meant to defeat software protection routines, including TI proprietary and Extended BASIC protection. The mail is about nine to one against publishing this information. So be it.

But don't think that we're just going to drop the subject. Far from it. You'll be reading updates about the problem in this column or elsewhere for as long as it remains an issue. For example, one software developer writes: "We have received a threatening letter from a certain California pirate, indicating that he was about to make public the means for copying our program if we didn't kiss certain parts of his anatomy. We didn't, and haven't had a sale in California for months!"

It would seem that some of the pirates would just as soon watch the programmers walk the plank. If they succeed, it's the honest user who will lost the most.

### NEW PROGRAM FORMAT

Starting with this issue, we will not be setting type on program listings that appear in MICROpendium. The only exception will be for very short listings. Instead, we will use printouts of program files. We hope to eliminate proofreading errors by doing this.

### NEW STUFF

The highly sought, and until now elusive, 80-column card is now available from Foundation Computing. There's a few caveats regarding its use, but for the first time TI users can have an 80-column display.

One wonders why such things weren't available when TI was still supporting its home computer. Of course, the development of such things takes time, and so one shouldn't be surprised at all the innovative software and hardware that's been coming out since the computer was discontinued by its maker. It's just a very unusual circumstance, that's all. What defunct machine has ever had such post-mortem support? Now, finally, we've got a 1200 baud terminal emulator, an 80-column card and a double-density disk drive controller. What next?

### ANNOUNCING A CONTEST

You'll notice in our User Notes column that we are starting a programming contest. There are a number of software prizes to choose from. If there's enough interest in it, we'll continue to expand on it. We're just running it up the flagpole to see if anyone salutes.

And, to close out this month's column, I've give you a thought for the day. If you were stranded on a desert island with a TI home computer, peripherals and a power source, and you could have any five pieces of software, what would you choose? I can think of more than five I'd like to have, but I've got to draw the line somewhere, and five seems like a good number to me.

That's all for now.

—JK

# Feedback

## Useful stuff

In reading your May issue I was surprised to see something on turning the disk drive off, as I was just this morning working on this same problem for our local users group, Monterey Bay 99ers.

If you CALL PEEK(-31888,A,B) you will see A=55, B=215. To turn off the disk drive enter CALL LOAD(-31888,0). As you said, enter CALL LOAD(-31888,55) to turn it back on.

Also, it should be said that this is useful when running BASIC programs that are over 12K, since these load into the console RAM and with Extended BASIC and disk drive this is reduced to less than 12K. However, I would recommend using the Mini-Memory or Editor/Assembler and enter 1 for BASIC since a lot of these programs user character sets 15 and 16, which are reserved for sprites in Extended BASIC. Also, Extended BASIC uses up about 2K of console RAM.

I hope this will help your readers better understand what it is that you are trying to say.

**Walt Davies**
**GATOR SOFTWARE**
**Salinas, California**

## Clean keys

The solution offered by Chuck Moats to the GROM problems (March issue) was very helpful.

Another common problem is a key which prints two or more letters instead of one. The solution to this came off of The Source. Lift off the plastic key with a pair of pliers, shoot in some quality contact (TV tuner) cleaner onto the switch and press the key back into place. Sometimes part of the switch comes up with the key, but this is no problem if you are gentle. You need small slip joint pliers to get a grip on the keys.

**Bob Stephenson**
**Albuquerque, New Mexico**

## Suggestions

Since my mama always told me to say something nice; I and a lot of other users are mighty glad to see you filling the void of TI mags since Compute is gone and 99'er is going (no tears here). Now for the hardball. I have been impressed with some past issues, particularly with coverage of important software like the IUG database (even if it is a poor implementation), (Companion) word processor review, coverage of Ralph (Fowler's) TIBBS, and even the users hint about previewing formatted documents in TI-Writer. However, I do have some suggestions.

The "extra-memory" hint is BS! I've seen this LOAD put out all over the place and it don't work. All you're doing is loading a value that is spit back on the SIZE command. I call this kind of thing psuedo-science and information sources like yours should be putting a stop to it. There are several simple tests you could have run, such as the "Size in BASIC" hint on the same page.

As for the reviews, I liked the TE-1200 (first write-up I've seen), but I thought the game reviews were an April Fools joke until I realized it was the June issue. Since when do people get paid for ripping off a game like Star-Trek and just changing the names. There's a public domain program available in CompuServe called Super-Trek that really utilizes TI's graphics and is a quantum jump ahead of this.

Having said that, I would like all the back issues before May if available, and keep it up! Also, I vote for disclosing protection breaking schemes for backup purposes only. I've personally backed up every protected disk I have through either LOADs or rewriting disk sectors (and haven't given any away). And the excuse by software developers about not writing for TI because they are copied and traded just doesn't wash. Apple users are famous for this and they have plenty. TI doesn't even have a single commercial protection-breaker available while Apple has several hardware and software versions.

**Curt Purdy**
**Phenix City, Alabama**

## Users must pay

I'd like to respond to the issue of publishing deprotection methods: Please don't! It would be a disservice to software supplies, and, ultimately, to users.

It is difficult enough to recoup the investment in time, effort and money required to develop and market programs; jeopardizing the potential rewards of such investments will result in them drying up. After three years of much hard work, I've finally broken even—if I don't count the investment made in equipment. Given the very poor support we've received from consumers, it is very difficult to motivate myself to develop anything new. They don't buy what I've got now! And why should they, if they can just make copies, at will.

It's a sad indictment of today's moral and ethical standards that so many people either find nothing wrong with pirating software, or do so anyway. It is no different, to my mind, than picking the developer's pockets. The logic of the rationalization—prices are so high, quality so low, products so misrepresented, and consumers so ripped-off: copying of software is perfectly justified—completely escapes me.

Who is kidding whom? Anyone who copies a program, other than one he owns, for his personal use, is morally guilty of theft! Selling the original/copy and retaining the copy/original, is equally immoral, as is accepting or buying a copy known to be illegally produced. Personal use of an illicit copy is simply

**(Please turn to Page 5)**

# Feedback

(Continued from Page 4)

personal use of stolen property—the creative work of the copyright holder. (Our DISKIT and BACKUP programs encode program copies with the serial number of the original purchaser to discourage their use for piracy. Extended BASIC program copies immediately display the number when the program is RUN.)

What consumers and developers need is just what you are producing now: fair reviews of what is available, so consumers can locate products of a quality and price that match their needs and willingness to pay. What developers need is an affordable and effective advertising vehicle. Reader response to your ads will determine h o w effective a vehicle MICROpendium is—it's too soon to judge.

To sum up, if users want more and better programs, they must be willing to pay for them, and developers must be motivated to produce and market them. You can do a lot to help or hinder both.

**Larry Sabo**
**Maple Leaf Micro Ware**
**Kanata, Ontario**

## Another 'no'

I wanted to write regarding your editorial "Who needs protection anyway?" Are you serious, or are you just trying to find out if anyone reads your editorials? I can't imagine that you really want to drive that last nail in the coffin. It is true that the deprotection codes have appeared in a few newsletters, but the great majority of of newsletter editors have refrained from publishing them. At least a dozen newsletters reprinted my editorial comments on the subject, and several of the editors wrote their own very strong editorials on the subject.

It is true that the deprotection codes have been passed around by word of mouth and on the BBS, and are known to most of the users who belong to users groups and who do any programming. However, they are not known to most of the users who use their computer only to run programs and who don't know what most of the keys are worth. And they ar not known to very many of the hundreds of thousands of TI owners who have no contact with a users group. But if the codes are published in a national magazine...! I can't imagine that the TI market will stay active enough to support development of new cartridge-based programs for too long. After that, if everyone knows how to copy the disks and cassettes, will anybody bother to program anything?

This doesn't affect me, because I write in BASIC and can't protect anything. I just try to offer so many different programs that maybe somebody will want something they haven't been able to copy for free. However, I like the TI computer and I'd like to see it die a natural death rather than be murdered.

A few of the user groups are irresponsible swap clubs, but most of them are, as a group, very conscientious about copyright laws. But as for the individual members of those groups—75 percent of them will copy anything they can get their hands on. Another 20 percent or so are more responsible—they will only let a few of their friends copy their programs, and their friends will only let a few of their friends...and put that in your computer, run it through a loop a few times, and see how much market is left!

As you say, take away the profit motive, and there's no incentive.

**Jim Peterson**
**Tigercub Software**
**Columbus, Ohio**

**The Feedback column is for readers. It is a forum to communicate with other readers. The editor will condense excessively lengthy submissions where necessary. Contributors should restrict themselves to one subject for the sake of simplicity. Mail Feedback to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.**

## Debugged

Most who tried the two-line routine under the headline "Size in BASIC" that was included in the May User Notes column probably figured out what was wrong with it on your own. For those who didn't, let us say that everything was wrong with it.

Briefly, here's the right stuff:

```
80  S=S+8
90  GOSUB 80
```

Add these lines to the beginning of a program and enter RUN and wait until you receive a MEMORY FULL IN 80 message. Then enter PRINT S. A number will appear indicating the amount of memory in bytes available.


**SST EXPANDED BASIC COMPILER**

The SST Expanded Basic Compiler translates your Basic Program directly into machine language while allowing you to edit and debug using T.I. Basic.

Example: A For Loop from 1 to 30,000
T.I. Basic 85 sec.
SST Expanded Basic 1.25 sec.

**Contains Most of the Features of Extended Basic PLUS MANY MORE!**

Contains:
- Sprites, Sound and String Functions
- Bit Map Mode for High Resolution Graphics
- Integer Arithmetic for Speed and Memory Conservation
- The Ability to Read and Write to a Disk Drive
- The Ability to Access the RS232 Interface
- The ability to allow you to build your own features into the Compiler. If you need a feature not in the Compiler, you can easily add it.

Requires Memory Expansion, Disk Drive and either Editor/Assembler or Mini-Memory

Send $95.00 for the SST Expanded Basic Compiler

**SST SOFTWARE, INC.**
P.O. Box 26
Cedarburg, WI 53012
(414) 771-8415

Wisconsin Residents Add 5% Sales Tax

.....Texas Instruments TI-99/4A — COMPUTERS, COMPONENTS AND SOFTWARE.....

# TEX✦COMP™

TI USERS SUPPLY COMPANY

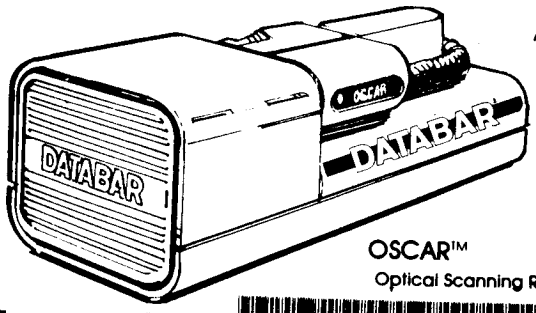
TEXAS INSTRUMENTS AUTHORIZED SALES

AUTHORIZED DEALER

## Attention TI Owners, Here's . . .

# OSCAR . . .

For the
Texas Instruments Home Computer




OSCAR™
Optical Scanning Reader

## An Incredible Software Entry Breakthrough!

sample bar code from an OSCAR program

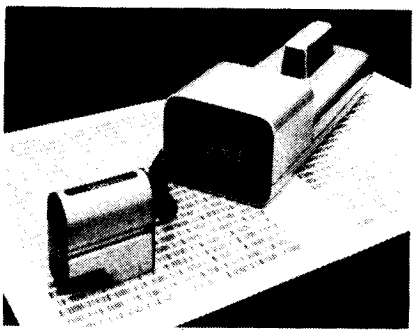
**OSCAR is an optical scanner that reads and enters software printed on paper in bar code. Eliminates typing-in programs and cuts the cost of software to only a few dollars per program.**

## No Disk Drive or Cassette Player Required!

**Scan in programs each time you want to run them. Takes just a few minutes. Or scan them in and store them on blank disks and tapes.**

## Fantastic Software Support!

**Dozens of programs available now. Details packed with the scanner. New software released frequently. Great games, educational programs, personal finance, word processing, and much more. Only a few dollars each.**



*Great software at a great price. And an easy, fast method of programming your home computer. That's what OSCAR is all about.*

## Introductory Special

**$49.95** *postpaid**

**Includes OSCAR and 8 free software programs.**

**Extra: For only . . . $39.95 more . . .**

**You get 18 additional software programs and a 3-ring binder for your software.**

MasterCard VISA

*VISA and MASTERCARD HOLDERS CALL DIRECT:*
**(818) 366-6631**
add3% for credit card orders

TERMS All prices F O B Los Angeles For fastest service use cashiers check or money order Personal checks take at least ten days to clear Add 3% shipping and handling ($3 00 minimum) East of Mississippi 4½% (Free shipping on all software orders over $100 00) We will ship UPS C O D with 25% deposit C O D to be paid by cash or certified check All products are sold with the original manufacturer's guarantee (sent on request) Prices and availability subject to change without notice We reserve the right to limit quantities

*Send Orders To:*
**TEX✦COMP™**
*P.O. BOX 33084*
*GRANADA HILLS, CA 91344*

* CONTINENTAL U.S. ONLY

*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 6½% sales tax.*

.....Texas Instruments TI-99/4A — COMPUTERS, COMPONENTS AND SOFTWARE.....

# TEX★COMP™

**America's Number One TI computer retailer**

**TI-99/4 PRODUCTS AT PROFESSIONAL PRICES**

TEX★COMP™ Special Purchase

SAVE 50%

**PARKER BROTHERS software cartridges for the TI-99/4A**

Only **$19.95** EACH *postpaid**

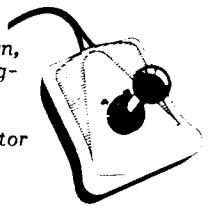
**Q*bert** *Life isn't easy for Q*bert. He's got to stay one jump ahead of Coliy the snake and all the other dastardly creatures. So spring into action and help Q*bert bounce from step to step on the colorful, three dimensional pyramids.*

**POPEYE** *Come aboard, mates! Join in the adventures of Popeye as you race him through a crazy maze while Brutus and the Sea Hag do their best to keep him from winning the affection of his sweet heart -- Olive Oyl.*

**FROGGER** *Frogger's first challange is to cross a busy highway, reckless with hotrods and huge trucks. Beyond is the raging river, where the safety of a slippery log or diving turtle is all Frogger can count on to stay afloat.*

***NOTICE:*** *Non-TI modules made by Parker Bros., Atarisoft, Funware, Romox, and Navarone may not operate on TI-99/4A units with a 1983 copyright notice appearing on the main title screen. A new accessory "The Grom Buster" is now available from TEX-COMP at $34.95 (postpaid)to overcome this problem*

***IMPORTANT JOYSTICK INFORMATION:*** *The standard 8-way joysticks made by firms such as TI, WICO, ATARI and SUPER STIK do not work well with maze type games on the TI-99/4A. Diagonal joystick commands on many x-y axis TI games such as Munchman, Jawbreaker, Popeye, Pacman, and Parsec tend to slow down response or confuse the logic of the program causing a missed turn or the like. There is only one joystick available for the TI-99/4A that overcomes this problem. The **SUPER JOYSTICK II**(developed by TEX-COMP and Newport Controls. This arcade quality professional joystick has a selector dial which allows the user to lock out diagonal positions when playing high speed maze and similar type of games resulting in much faster response and higher levels of play. The **SUPER JOYSTICK II** is available from TEX-COMP for **$29.95** postpaid and has a five year warranty. It has been rated #1 by all TI Users Groups. A second unit (less adapter) is available for $24.95 .*



SUPER JOYSTICK II
The Only JOYSTICK that can control THE MUNCHMAN!

SEND ORDER AND MAKE CHECKS PAYABLE TO

**TEX★COMP™**

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

NOTE:

Texas Instruments

AUTHORIZED DEALER

VISA and MASTERCARD HOLDERS CALL DIRECT:

**(818) 366-6631**

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 6½% sales tax.

ALL PRICES REFLECT A 3% DISCOUNT FOR CASH
ADD 3% IF PAYING BY CREDIT CARD

* CONTINENTAL U.S. ONLY

WHEN IN SOUTHERN CALIFORNIA VISIT OUR MODERN WAREHOUSE OUTLET STORE WHERE YOU CAN PURCHASE THE ENTIRE TI LINE AT OUR REGULAR DISCOUNT PRICES.

# TEX-COMP™ Proudly Introduces INFOCOM™

## The next dimension.

## for the TI-99/4A They're Here.

*Meet your match. Meet Infocom games: perhaps the best reason in software for owning a TI-99/4A.*

*In fact, people have been known to purchase home computers and disk drives solely for the purpose of playing Infocom games. And they haven't been disappointed. Because these interactive adventures stimulate your imagination to a degree that nothing else in software approaches. Instead of putting funny little creatures on your screen, you are placed inside the story and confronted with startlingly realistic environments alive with situations, personalities, and logical puzzles the likes of which you won't find elsewhere. The prose is plugged into your imagination and you are catapulted into a whole new dimension. At last, you can spend an evening playing a computer game on your TI-99/4A and know that the entire investment was worthwhile. Infocom has released all 11 of their best selling titles in the TI-99/4A disk format*. TEX-COMP is supporting the entire Infocom line and all titles are in stock for immediate delivery. As the leading source of quality adventure games for the TI-99/4A, TEX-COMP will be selling the Infocom games as specially lowered discount prices to make them that much more easier to acquire....If you think that the Infocom experience is worth having, then step up to Infocom. All words. No pictures or graphics. Because there has never been a computer built by man (not even TI) that could handle the images produced by Infocom games and your mind. Infocom games draw their graphics from the limitless imagery of your imagination - a technology so powerful, it makes any screen produced by a computer look like graffiti by comparison. And nobody knows how to unleash your imagination like Infocom. The secret reaches of your mind are beckoning. A whole new dimension is in there waiting.....*

*The Infocom TI-99/4A experience:*

***ZORK®I,II,and III, DEADLINE, STARCROSS, SUSPENDED, The WITNESS, PLANETFALL, ENCHANTER, INFIDEL, and SORCERER.....***

INFOCOM™
The next dimension.

It's the year's best software at the year's best prices —

***SPECIAL TEX-COMP INTRODUCTORY PRICING ON INFOCOM GAMES:***

***STARCROSS and ZORK®I,II, and III*** *($39.95 sug. ret.ea.).....* ***$29.95*** *each postpaid**

***All other Infocom Games*** *($49.95 sug. ret.ea.)* ***$34.95*** *each postpaid**

* ***NOTICE:*** *All Infocom games are on disk and require a TI-99/4A equipped with a 32K memory expansion, a disk drive controller and a disk drive. They further require an Extended Basic, Mini-Memory, or Editor Assembler Module.* ***ALL*** *of the above are available at discounted prices from* ***TEX-COMP.*** *Send $2.00 for the latest* ***TEX-COMP catalog*** *and order kit and we include a $5.00 certificate that can be used for TI compatible accessories and software*

**BOOK OF HINTS** for INFOCOM™

***INFOCOM HINT BOOK***

*(A SHORTCUT THROUGH ADVENTURELAND-Vol II-Infocom)*

*This book presents solutions to all the Infocom adventure games to date including the highly popular ZORK® trilogy. Includes room definitions, hints and explanations, and a special "how to win" section. This book will help you get through one section of a game or guide you play by play to successfully complete the game. A must for anyone who is "into" the Infocom adventure games.* *TEX-COMP price.....$9.95 postpaid**

**SEND ORDER AND MAKE CHECKS PAYABLE TO:**

**TEX-COMP™**

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

Texas Instruments

AUTHORIZED DEALER

MasterCard VISA

***VISA and MASTERCARD HOLDERS CALL DIRECT:***

**(818) 366-6631**

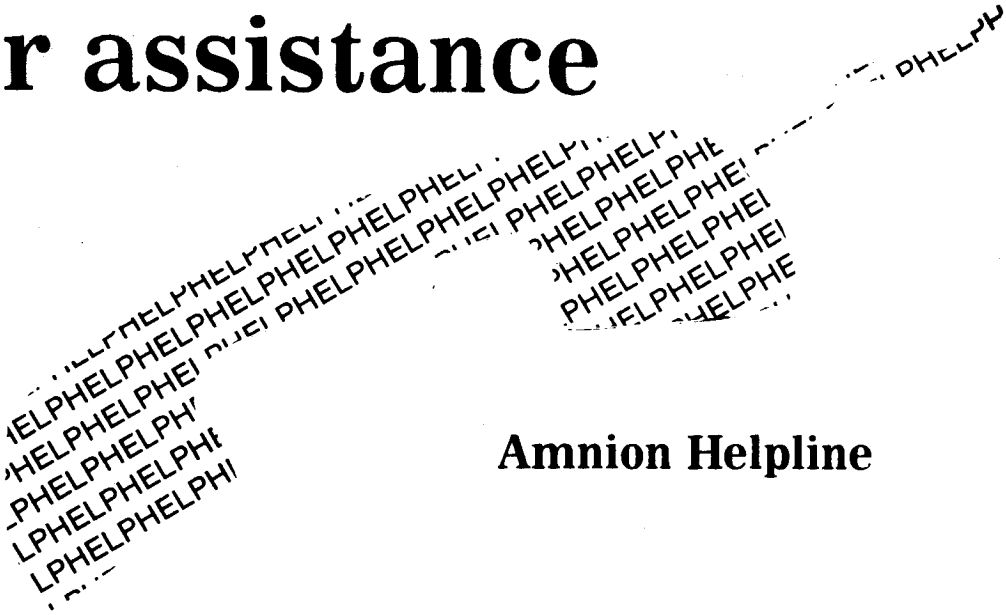
*NOTE: Payment in full must accompany all orders. Credit Card, Company Check or Money Order for immediate shipment. Personal checks require up to 4 weeks to clear. California orders add 6 1/2% sales tax.*

ALL PRICES REFLECT A 3% DISCOUNT FOR CASH
ADD 3% IF PAYING BY CREDIT CARD

*CONTINENTAL U.S. ONLY

WHEN IN SOUTHERN CALIFORNIA VISIT OUR MODERN WAREHOUSE OUTLET STORE WHERE YOU CAN PURCHASE THE ENTIRE TI LINE AT OUR REGULAR DISCOUNT PRICES.

# Ring for assistance


PHELPHELPHELP

# Copyrighting, how to go about it

The good news is that copyrighting your original computer program is not hard to do.

The bad news is that there are not enough legal precedents as of yet to say what that copyright actually means.

"The actual literary expression" is what is protected by copyright, explains Richard Anderson, a public information specialist with the Copyright Office. However, he notes, "Exactly what is protected and to what extent is still being defined by interpretations."

He notes that an idea in itself is not copyrightable, and that the formulas involved are not copyrighted.

Atari and Apple Computers now have cases regarding programs and program infringements in the courts, Vicky George, another information specialist with the Copyright Office, notes.

She also notes that the OCLC Database was recently registered "with a certain amount of argument."

She says "people who contributed to the database were objecting to registration on the grounds that OCLC isn't entitled to claim authorship or ownership. This might possibly end up in litigation."

Programming copyright cases are thus obviously pioneering territory for the copyright lawyers who take them on. But don't get a lawyer to handle copyrighting the program in the first place, because it is a relatively simple procedure. What you need is to get Form TX from the copyright office, fill it out and pay a fee of $10.

Form TX is the class for nondramatic literary works, which programs are considered to be because of the actual instructions to the computer that the programmer writes on it, Anderson explains.

(Form TX also comes in handy if you want to copyright any fiction or nonfiction, poetry or prose, or a textbook, reference work, directory, catalog, or advertising copy.)

Along with the form and fee, you will have to send the Copyright Office the first and last 25 pages of the printout from your program in source code. These printouts are all stored at a site in suburban Maryland under the auspices of the Library of Congress, Anderson says. He says that approximately 4,000 programs were copyrighted during Fiscal Year 1982.

To get the application, you can call the Forms Hotline of the Copyright Office at (202) 287-9100 at any time of the day or night to leave your request as a recorded message. Anderson says this will result in a faster response than a written request, but you may also write in for the form to: Copyright Office, Library of Congress, Washington, D.C. 20559.

Should you not be able to figure out everything on the forms or need additional information regarding copyright, you can get help by calling the Copyright Public Information Office at (202) 287-8700 weekdays between 8:30 a.m. and 5 p.m. Eastern Time.

The Copyright Office may be covering even further aspects of the computer field, George notes. Legislation has been introduced in both houses of Congress to copyright the mask works of semiconductor chips.

# AMNION HELPLINE—

(Continued from Page 9)

helpline, which he has continued to do since the main plant has moved to Australia, for Amnion customers and others.

He says questions he is asked range from "next to ridiculous ones to very, very difficult technical ones that I don't feel qualified to answer," for example, regarding hardware design.

A question might be as simple, for example, as "how to hook up a cassette recorder. It goes the whole gamut."

He says that "people are looking for someone to tell them the truth in that they've heard certain things about products—do they exist? There's a lot of rumors out there, that TI's going to go into business again, that sort of thing."

He notes that people have "been burned sending away to these little companies" and want to know whether products are good or not.

Romano says, "I can report what's been reported to me. I try to keep it at that level," rather than recommending products.

He says he can help users find sources for particular products and that he also helps with programming questions but that for the latter, "they have to write me a letter. That's another reason I cut the time on the telephone, because I spend the rest of my time answering letters."

The mailing address for the Amnion Helpline is 116 Carl St., San Francisco, CA 94117. Correspondents should enclose a stamped, self-addressed envelope.

Romano says he does not count the letters he's answered, but "last September I remember putting my 2,000th stamp on an envelope."

He became involved with the TI rather than another computer "purely by accident."

Planning to work on computerization of certain projects, he decided to learn about computers so he would be able to ask intelligent questions. After first purchasing a "little Sinclair" and finding that it did not meet his needs, Romano was planning to purchase an Apple when a friend told him the price for the TI had dropped.

"At that time I had never heard of TI," he says, even though the 99/4 computer had been in existence for about 10 months.

He bought the TI for $600 and started learning various programming languages and "it all just blossomed from there—it was pure accident."

# An ounce of prevention...

There's not a whole lot the average TI user can do to repair a piece of malfunctioning hardware. However, there are things any computerist can do to help prevent malfunctions, and most of them are of the obvious, common-sense variety.

For one thing, take a few minutes to wipe the dust away from your computer station. Pick up stray paper clips and other items that somehow find their way into things. If you've got a peripheral expansion box, make sure you vacuum the dust behind it periodically. Of course, avoid putting liquids next to your hardware for fear of spilling them.

If you live in an area where cockroaches are common, you might consider placing a thin layer of powdered boric acid under your hardware. The roaches pick this stuff up as they crawl over it. Eventually it dehydrates them and they die.

Those with cassette players should keep the recording head of their recorder clean. User can purchase a head cleaning solution or use alcohol. Kits are available that include a mildly abrasive, woven cassette tape and cleaning solution for this purpose.

Cleaning of disk drive heads is similar to the cleaning of cassette heads. There are a number of head cleaning kits available, consisting of a cleaning disk and a bottle of alcohol-based cleaning fluid. Prices range to $25 and more, but they can last a year or more.

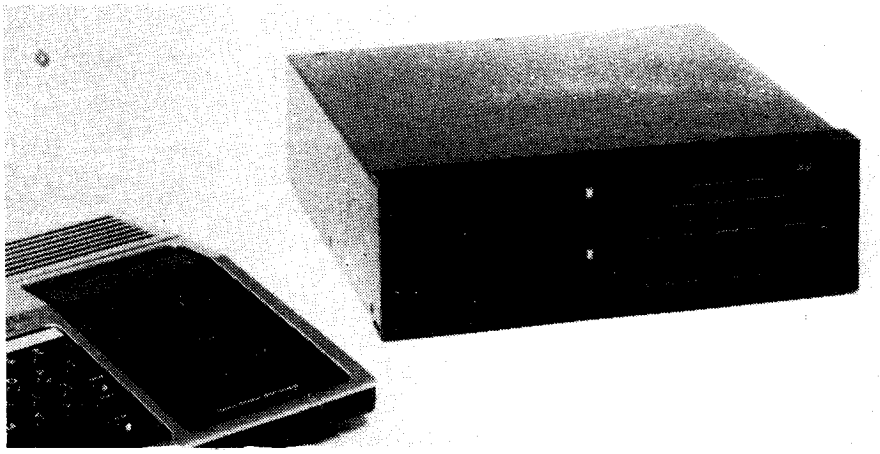
The magnetic oxide on the surface of a disk contains a lubricant that reduces head wear. However, this oxide will accumulate over time on the head. This buildup can result in lost data, reduced head life and reduced disk life.

Disk cleaning kits are designed to remove the oxides from the heads, but must be used strictly according to directions. When the instructions call for the use of nine drops of cleaning fluid, don't think that 99 drops will clean the heads much better. Most likely the extra fluid will drip into the works, causing more serious problems than those caused by oxide buildup. When the instructions call for running the cleaning disks in the drive for 10 seconds, don't think that running them 60 seconds will clean them even better. The cleaning disks are mildly abrasive and will damage drive heads if used excessively. Also, don't clean disk drive heads too often. Once a month is enough. Cleaning them every six to eight weeks may even be a better idea.

Also, it's not a good idea to leave a disk in the drive when you turn the machine off. Nor is it a good idea to leave the disk drive door closed when turning the system off, since closing the door is what brings the heads together. If you're worried about something crawling into the drive when the system is down, close the drive door after the system has been turned off. Similarly, start the system with the drive doors open.

There are disk drive test disks available for some computers, though MICROpendium has not seen one for the TI. The disks run tests that measure alignment and other factors that could result in more serious problems if left unchecked. Corrective measures are almost always cheaper than repairs.

Just a little common sense can go a long way.



## CC-99000 Expansion System

The CorComp 99000 Series expansion system, pictured above, is expected to be released this year for use with the TI99/4A. The box will also be used with the company's CC-99000 computer, which may be introduced by the fourth quarter of this year, according to the company. The expansion system supports up to four double-sided, double-density disk drives and includes 32K of random access memory. Two half-height disk drives can be mounted horizontally inside the box. The box measures 12.5 inches wide, 4 inches high and 12 inches deep. It will use a flexible cable to connect to the TI99/4A or the CorComp computer.

## Wrong CAUG

Somehow we've gotten the Capitol Area Users Group of Harrisburg, Pennsylvania, mixed up with the Cleveland Area Users Group. In this case, a CAUG by any other name isn't necessarily the same CAUG. The program cropped up in the User Notes column for June. We credited the Cleveland group for a disk loader program when it was actually the Harrisburg group that originated the program. We hope this clears things up.

## MORE ASSEMBLY LANGUAGE EXCITEMENT FROM CHALLENGER SOFTWARE INTERNATIONAL

*9900BASIC Assembly Language made as easy as BASIC with this utility package. Use BASIC-like commands to create high speed machine code programs.*
*ED/ASM 48K*
*$49.95 DISK*

**Pizza!** Serve up pizza to a group of colorful but impatient customers.
ED/ASM OR X-BASIC 48K
$19.95 DISK

**Super Copy.** We have yet to find the program or file that Super Copy can't handle.
X-BASIC 48K
$19.95 DISK

CHALLENGER SOFTWARE INTERNATIONAL
Box 50150, St. Louis, Missouri 63105

**Gravity Master.** A superior arcade game with 20 screens and the ability to create an infinite number of game screens and variations using the built in editor.
X-BASIC 48K
$19.95 DISK

**Spy's Demise.** Official TI version of the bestselling Apple program
X-BASIC, ED/ASM, MINIMEM
$17.95 CASSETTE $19.95 DISK

And don't forget the programs that made us famous!

| | |
|---|---|
| Starprobe 99 | BASIC |
| Wallaby | X-BASIC |
| 3-D Stalker | BASIC |
| Horrors! | X-BASIC |
| Draw Poker | BASIC |
| Game of the States | BASIC |
| Mini-Pede | MINI-MEM ED/ASM |

$14.95 CASSETTE $16.95 DISK


# How to spell, even if you can't

The 99/4 Auto Spell-Check by Dragonslayer ASC is out. The creation of Tom Kirk, it can be ordered by writing him at the following address: 2606 Ponderosa Dr., Omaha, NE 68123. Purchasers may also order by telephone using Master Card or VISA credit cards. The number is (402) 291-8323.

The program comes on two disks and includes a 20,000-word dictionary. Users may create as many user-defined dictionaries as they like. The program will be reviewed in the September issue of MICROpendium.

The program is written in TMS-9900 native object code. It is 7.8 kilobtyes long. The program requires a memory expansion and disk drive to operate. It will work with either the TI-Writer or Editor/Assembler cartridges. The program is priced at $49.95 plus $3 for shipping and packaging. Included is a 10-page manual.

The 99/4 Auto Spell-Check operates by comparing text files with the dictionaries and then displaying words not included in the dictionaries on the screen. Users have the option of adding these words to a user-defined dictionary file, correcting misspelled words and viewing the word in context, among other things. The program can handle text files containing up to 23,000 characters.

# Reviewed in MICROpendium

Listed below are the products that have been reviewed in MICROpendium and the issues in which the reviews appeared.

| | |
|---|---|
| B-1 Nuclear Bomber | February |
| Tandon TM-100 Disk Drive | February |
| Void | February |
| Beanstalk Adventure | February |
| Microsurgeon | February |
| On Gaming | February |
| Database 500 | February |
| Star Trek | March |
| Escape From Balthazar | March |
| Garkon's Getaway | March |
| Sky Diver | March |
| Mail-Call | March |
| Prowriter 8510 Printer | March |
| Monthly Budget$ Master | April |
| Budget Master | April |
| Home Budget | April |
| Thief | April |
| Donkey Kong | April |
| Khe Sanh | April |
| Companion Word Processor | May |
| Q*Bert | May |
| Mad-Dog I&II | May |
| Programs for the TI Home Computer | May |
| Creative Expressions Accounts Receivable/Accounts Payable | June |
| CDC 9409 Disk Drive | June |
| Starship Concord | June |
| Lost Treasure of the Aztec | June |
| ASW Tactics II | June |
| Theon Raiders | July |
| Introduction to Assembly Language for the TI Home Computer | July |
| Game of Wit | July |
| Pole Position | July |

# Foundation unveils 80-column card

The company that has been selling a 128K card for the TI99/4A has changed its name and is introducing a new product to the TI home computer market.

Foundation Computing, formerly known as Foundation, has developed an 80-column card for the TI Peripheral Expansion Box. The card will come bundled with the Companion word processing program, modified for an 80-column display. The company is also looking into producing other programs for the 80-column card, including a terminal emulator.

According to company official Bill Hunter, the card has been in development since last January. Although prototypes are available, production versions are expected to be produced by the end of July, with delivery to begin in August. Foundation Computing was waiting for delivery of controller chips for the card in early July prior to actually assembling the card.

The card will resemble TI-manufactured cards, Hunter said. The company is also going to start marketing its 128K card in a case that is identical to TI peripheral cards, he said. Hunter said this is because the company wants its products to "look as officially TI" as possible.

The 80-column card can be used with a number of currently available programs in a limited way, according to Hunter. With programs such as Microsoft's Multiplan spread sheet, users can produce an 80-column display of data on the screen by accessing the card as a device in much the same manner as a user would access a printer. Although users can display an 80-column screen in this way, they must actually input the data in the normal 40-column Multiplan mode.

According to Hunter, the 80-column card can provide users with an 80-column display using virtually any program that can access a printer.

The 80-column version of Companion will be able to access the 80-column card directly so that input can be done in an 80-column mode.

Those interested in ordering the card may contact Foundation Computing at (415) 388-3840. Hunter says that the company is taking names but not payments on the cards. When they become available, he says, those who submitted their names first will be given the first opportunity to purchase the card. The card is priced at about $250.


Maple Leaf Micro Ware

P. O. Box 13141
Kanata, Ontario
Canada K2K 1X3

**SKY-DIVER** Realistic and exciting parachuting accuracy competition for up to four players. Fickle winds make precision more difficult for the leader.
In EXT-BASIC. $17.95

**HANG-GLIDER PILOT** Hang-gliding game and trainer, for up to four players. Very accurate simulation; colourful graphics. Don't break your neck!
In EXT-BASIC or 16K BASIC (Abridged). $19.95

**DEVIL CRAZE** Devilishly fun recognition-response game that will drive you crazy over your left and right.
In Ext-BASIC or 16K BASIC (Abridged). $14.95

**HAPPY MATH** Engaging addition and subtraction exercises for 4-6 year olds. Optional speech output (requires TE2 module and speech synthesizer.)
In 16K BASIC. $14.95

**COUNTING WITH COINS** Large, realistic coin designs in U.S., Canadian or Mexican currency. (Specify when ordering.) Difficulty matches player's ability.
In 16K BASIC. $14.95

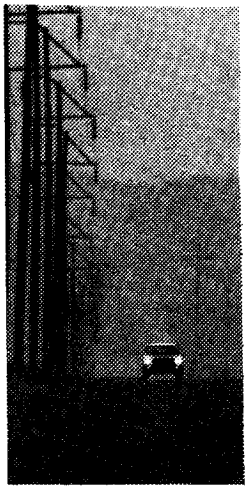
**SPELLING & PHONICS TUTOR** Compose your own lessons with DATA statements, using words within phrases which illustrate their correct context. The player can review the phrases, or practice spelling/reading the words. Highly motivating! Speech synthesizer & TE2 required.
In 16K BASIC. $14.95

**DISKIT** Save your Scott Adams Adventure Series (TM), MMM-targeted Assembly Language, and file-protected EXT-BASIC program tapes to diskette for rapid loading convenience. Disk system & MMM module (or Editor/Assembler & Memory Expansion unit) required.
On diskette. $29.95

**BACKUP** Create a backup copy of your file-protected EXT-BASIC programs on tape, still file-protected, of course.
MMM module required. $19.95

On cassette tape, unless noted.
Prices are in U.S. funds, and include shipping and handling. For Canadian prices, add 25%. Ontario residents please add 7% P.S.T.
Catalogue $1.00, refunded on first order. Programs are also available from TENEX and UNISOURCE.





There is a road.

Many cancer patients need transportation to and from treatments. That's why we ask for volunteers who can give some time each month to drive them. A cancer patient's road to recovery can be a long one, but it's made much easier when there's a friend who can help along the way.

AMERICAN CANCER SOCIETY



NOT JUST USER FRIENDLY. . .

**USER SPECTACULAR!**

COMPANION. User rated as better than Word-star on the IBM-PC. Better than MacWrite on the Macintosh. And of course, better than TI-Writer.

Extremely natural and easy to use, COMPANION is the world's fastest word processor. Even at an incredible 30 keystrokes **per second**, COMPANION reformats the entire 40 column screen to its **final status** between keystrokes. And **never**, ever, misses a key!

For a complete description, WRITE or PHONE for our FREE eight page brochure!

Diskette $79.95 **INTELPRO** (514)-656-8798

5825 Baillargeon St. Brossard, Quebec, Canada J4Z 1T1

WE'RE **DEALER** FRIENDLY!

# Escape with TI-Writer

The manual that comes with TI-Writer is first-rate, when it comes to showing you how to use the program. But there's a few subjects that it ony touches upon, leaving the user to fill in the gaps on his own. One of these subjects has to do with the use of ASCII codes.

The manual provides several paragraphs of information, mostly to let yo know that, yes, ASCII codes can be used. It doesn't tell you much about how to use them, though. So, for those who are interested in these things, read on.

Through the use of ASCII codes users can instruct their printers to print solid lines of varying sizes, as well as graphics and other useful things. To access these items though the TI-Writer cartridge, you are required to get into the special character mode. you do this by pressing FUNCTION U. This will change the shape of the cursor. To get out of it, you simply press FUNCTION U a second time.

All these should read CONTROL U

Once in this mode, you may access the various escape control characters, which includes ASCII codes 0 to 31. The TI-Writer manual includes a list of these definitions. The keyboard is defined through the use of ASCII codes 0 to 127. Included here are all the shifted and unshifted keys and some of the FUNCTION keys. ASCII codes above 127, however, must be accessed through the use of an escape code, such as ASCII 27, which is defined as FUNCTION R on the keyboard.

Suppose you want to print a solid line across the page. The only way to do this with TI-Writer is to first use the transliteration command to define the ASCII code that represents a solid line. In this case, we'll use ASCII 130, which will create a line about one-sixteenth of an inch wide. We'll use the asterisk to represent this code. The transliteration line should look like this: .TL 42: 27,130, where 42 is the asterisk, 27 the escape code and 130 the ASCII code for the solid line.

Having defined the transliteration command, place the cursor at the point where you want to start the solid line. Then press FUNCTION U and then press FUNCTION R. You will notice that the FUNCTION R is represented on the screen by a character that looks like a tiny "b." Now, follow this with an asterisk. This will result in the printing of a line that is one column long. To make a longer line, simply alternate FUNCTION R symbols with the asterisk until you've reached the length of line you want. Then his FUNCTION U to get out of the special character mode.

When you print it out, you'll see your line. You may be able to figure out a way whereby you don't have to repeat the FUNCTION R-asterisk routine for the length of the line. Let us know if you do and we'll pass it on to other readers.


ANCHOR AUTOMATION
Texas Instruments TI-99/4A — COMPUTERS, COMPONENTS AND SOFTWARE

TEX-COMP™

America's Number One TI computer retailer
TI-99/4 PRODUCTS AT PROFESSIONAL PRICES

CorComp Inc.

CorComp PRODUCTS
32K RAM Expansion Card for TI P-Box.....$119.95
RS232 Card for TI P-Box.....$ 79.95
Y Cable to add 2nd serial port to RS232 card.....$ 27.95
DD/DS Disk Controller Card for TI P-Box.....$179.95
9900 Micro Expansion System
RS232 Stand Alone (1 serial & 1 parallel).....$149.95
SPECIAL Free 2nd serial port upgrade and Y cable with above!
RS232 Stand Alone with 32K RAM, DD/DS Disk Controller, and Free 2nd serial port upgrade & Y cable.....$349.95
Upgrade for RS232 Stand Alone (32K & DD/DS Cont.)$249.95
99000 Expansion System
Comes complete with RS232, 32K RAM, DD/DS Controller, Space for two ¼ height DD/DS Disk Drives (not inc.)..$469.95

TI PHP1250 Disk Drive (DD/SS).....$199.95
Complete Case & Power Supply with all cables to convert TI Drive to Free Standing Drive #2.....$ 99.95
TEAC ¼ height DD/DS Drive (2 will fit in TI P-Box or CorComp 99000 Box.....$189.95
Cable Kit to mount 2 ¼ TEAC Drives in either of above units ( TI or CorComp).....$ 29.95
Cable Kit to mount 2 ¼ DD/DS Drives in Free Standing Case.....$ 19.95

DD/DS/Flippy Premium Disks.....10 for $29.95
SPECIAL..20 for $47.00.....
NAVARONE ACCESSORIES FOR TI-99/4A
Cartridge Expander (Widget).....$ 29.95
Disk Fixer (Module).....$ 29.95
Grom Buster (runs 3rd party modules on 1983 consoles$ 34.95

99000 Expansion System

9900 Micro-Expansion System

$100.00 SPECIAL $100.00 FREE Source/TEXNET sign on with purchase of Signalman MK III

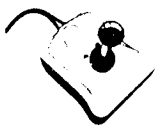
Mfg. Suggested List Price $139.00

TEX-COMP PRICE
Limited Time Introductory Offer
$94.95
Including shipping & insurance

SIGNALMAN™ MARK III
TI 99/4A COMPATABLE
MODEM
Finally, a low cost, direct connect, high quality and super reliable TI-99/4 and 99/4A compatable modem that comes complete and ready to use — just plug it into a RS/232 expansion card.

SPECIAL: WE HAVE A LIMITED SUPPLY OF TI TERMINAL EMULATOR II WHICH CAN BE ORDERED WITH THE MODEM FOR $24.95. (one per modem please)

ACCESSORY: 9VOLT BATTERY ELIMINATOR FOR MARK III.....$10.95


SUPER JOYSTICK II
RATED #1
A commercial arcade joy stick adapted for use with your 99/4 or 99/4A. 2-way setting for Munchman and Parsec-a Tex-Comp exclusive
29.95 POSTPAID

SEND ORDER AND MAKE CHECKS PAYABLE TO
TEX-COMP™
P.O. BOX 33084 — GRANADA HILLS, CA 91344

Texas Instruments
AUTHORIZED DEALER

VISA and MASTERCARD HOLDERS CALL DIRECT:
(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 6½% sales tax.

## Terminal Emulator-1200

# Going faster with the RS232

TE-1200 is the only terminal emulator program available for the TI99/4A that permits users to transmit and receive data at speeds of more than 300 bits per second via the RS232 port. Let me qualify that: I know of only one other terminal emulator program, TI's Terminal Emulator II cartridge, and it operates at no more than 300 baud.

**Performance:** TE-1200 is a fully-programmable terminal emulator program, allowing the user to select baud settings ranging from 110 to 9600, parity (odd, even or none), the number of data bits (7 or 8), duplex (half or full) as well as the number of stop and start bits. The default is for X-off and X-on.

TE-1200 allows the user to do virtually anything he can do with TEII except access the speech synthesizer. It also does not support graphics or color.

I operated the program out of the Editor/Assembler cartridge, accessing both CompuServe and The Source, as well as a university mainframe, at both 300 and 1200 baud. I used a Signalman Mark XII modem, which will be reviewed in the next issue of MICROpendium.

Those who subscribe to The Source, in particular, know that one of the most frustrating aspects of telecommunications is the sometimes interminable wait between the time a command is issued by the user and the time it is finally implemented by the host computer. While much of this annoying condition is the result of such variables as the number of users using the system at that time, I found that at 1200 baud these delays were much shorter than at 300 baud.

Using a 1200 baud modem also provides the user with more control codes than are available with many 300 baud modems. TE-1200 allows the user to take advantage of such modem features as auto dialing and answering. However, these are not a function of the terminal emulator per se, though they are implemented through it.

## Review

**Report Card**

**Performance:** ..... **A**
**Ease of Use:** ..... **A**
**Documentation:** ..... **C**
**Value:** ..... **A**
**Final Grade:** ..... **A**

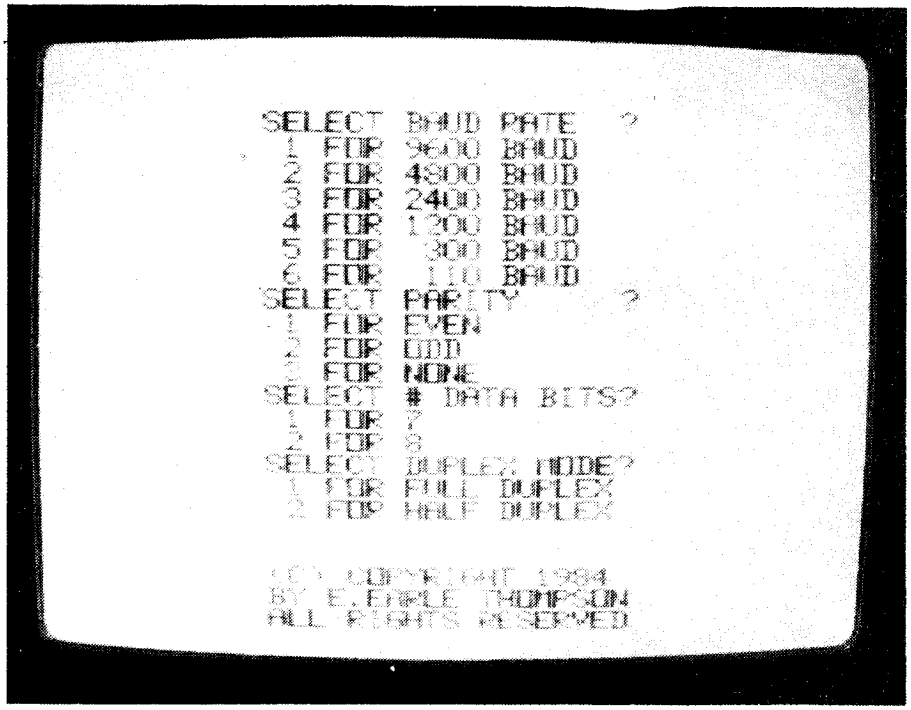
**Cost: $49.95 (diskette)**
**Manufacturer: Softmail Inc., P.O. Box 745, Rockwall, TX 75087, (214)722-1079**
**Requirements: console, monitor or television, disk drive and controller, expansion memory, Editor/Assembler or Mini-Memory cartridge, printer is optional**

Unlike TEII, TE-1200 uses the 32K memory expansion, and provides the user with 12.5 kilobytes of data storage. TEII stores only about three screens of data. While TEII is able to print out only the screen that is displayed when the output command is issued, TE-1200 allows the user to define the beginning of the output by pressing the CONTROL 3 key. Pressing the CONTROL 4 key defines the ending parameter of the material to be printed. Unfortunately, TE-1200 does not permit the user to page back to print out previously viewed data. (However, one can page back to view the data.)

TE-1200 also provides more flexibility in correcting text before sending. Using such features as the SMAIL function on The Source, for example, I was able to retype several lines, even after hitting the ENTER key. Using TEII, one can retype only the line hs is typing on, and then only before hitting the ENTER key.

TE-1200 also uses CONTROL keys to start a file transfer and to terminate it and permits the user to reset the transmission parameters with-

**(Please turn to Page 19)**



## Tower

# Keeping them flying

Tower (aka Civilian Air Traffic Controller) is among the most recent programs offered by Not-Polyoptics. Although most of the company's games are written in BASIC, some of its most recent additions, including Tower, utilize Extended BASIC. And to good effect, I might add.

**Performance:** The object of Tower is to guide a number of airplanes of varying descriptions to a safe landing while simultaneously insuring safe takeoffs for those already on the ground.

According to the documentation that comes with the game, you are an air-traffic controller at Washington National Airport. It is night-time and there is poor visibility, with a ceiling of 400 feet. You are equipped with a radar screen that provides a view of the airport and surrounding areas. Visible on the radar screen are the Potomac River, the Pentagon and populated areas. You have two runways under your control, north and south. Arriving airplanes approach the field from either the northwest or southeast and it is up to you to provide the commands that will help the pilots land the planes safely.

You have a number of commands at your disposal, including those having to do with changing altitude and direction and velocity (by raising or lowering flaps). You can also place a plane in a holding pattern if you like. The status of each flight is reported at the right of screen, providing such information as flight identification, course, altitude, type of plane and flap position. There are three types of planes using the airport: 727s, DC9s and private aircraft. Each type has its own characteristics. For example, DC9s are fast but difficult to control.

The game starts out with a screen devoid of flights. Then the first flight appears as a white blip and its status appears at the right of the screen.

## Review

**Report Card**

**Performance:** ..... **A**
**Ease of Use:** ..... **A**
**Documentation:** ..... **A**
**Value:** ..... **A**
**Final Grade:** ..... **A**

**Cost: $18**
**Manufacturer: Not-Polyoptics, 13721 Lynn St., Woodbridge, VA 22191**
**Requirements: console, monitor or television, cassette recorder, Extended BASIC cartridge**

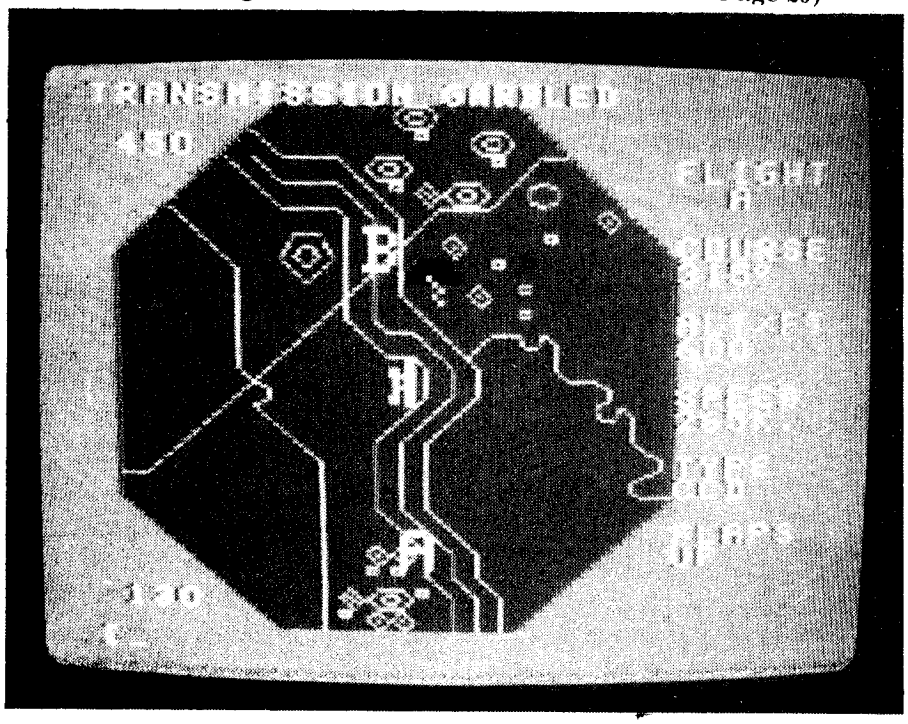
From now on it's up to you to get it on the ground.

By inputting commands regulating altitude, direction and velocity, you are able to guide the planes to a safe landing. Complicating the matter, however, is the fact that the second, third, fourth and fifth flights appear on the heels of the first. Dealing with five flights at once is the challenge that the game offers and one which, at the higher levels, becomes difficult. At level one, the planes appear on the screen at respectable intervals so that you can guide one to a landing before giving serious consideration to the next one. At levels two and three, the planes come onto the screen in rapid succession, requiring you to consider what effect an altitude or velocity change on one plane will have on those following it. You may have three or more planes stacking up from one direction, making such considerations vital. Also, one must make allowances for momentum and inertia when issuing commands.

With several planes on the screen at one time it gets difficult to recall which is which. Using the Identify command, you can momentarily replace each blip with a large letter representing their IDs. Very handy, indeed.

Further complicating matters at the higher levels are such things as clearing planes on the ground for takeoff and getting them airborne

**(Please turn to Page 20)**



## Galactic Battle

# Rule the universe, admiral

Galactic Battle is a space game for 1 to 9 players in which each player competes against the computer and others in an attempt to take over a galaxy.

**Performance:** Although this game uses several screens, the graphics are not Galactic Battle's strong point. Its strength lies in the playing out of a battle between as many as nine "admirals" who command fleets of space ships.

Prior to the start of battle, players are asked whether to load a game that has been saved. (The save game feature is a necessity, since a full-scale galactic war can take hours to complete.) If not, the computer asks whether you have an 80-column printer attached. If so, you may choose to have the galactic map printed out. The players then select the number of planets to include in the galaxy, from 10 to 34, the number of players, from 1 to 9, and the time period, from 1 to 999 "years." The time limit may be changed while the game is being played.

There is a 20 row by 20 column screen map for those who play without a printer. Although this map shows only the relative positions of the planets, a display with the X and Y coordinates of the planets will also appear. Players may then mark the coordinates on a sheet of graph paper for a true representation of the galactic map. Players may reject any arrangement of the galaxy if they wish. Once a map has been accepted, however, it remains the same for the duration of the game.

Each planet is identified by a number, from 1 to 34, depending on the number of planets in the galaxy. Each player starts out with a fleet of 100 vessels on his home planet with which to conquer the galaxy.

The game now gets under way. The main screen consists of two rows of data listing the planet number, the owner's number, the number of vessels occupying it and the production capability of the planet. Of these figures, the most important is the "production" number. This refers to the number of vessels it produces during a year. The more ships your planets produce the larger and more powerful fleets you are able to create.

A turn ("year") consists of each player inputting the number of vessels in a fleet, the number of the planet from which the fleet is to come and the destination of the fleet. Players may enter as many fleet movements as they like during a turn. The actual arrival of the fleet at its destination is determined largely by the distance it has to travel to get there.

These fleet movements may be inputted at each turn. The actual outcome of battles is determined between turns when a second screen appears, depicting a planet's surface. There are several gun implacements on the surface. Overhead, the attacker's fleet, in the form of a rocket, passes across the screen. Indicators at the bottom of the screen display the strength of the two forces as the battle progresses. One nice touch is that the gunners on both sides occasionally miss, thus improving the chances of the weaker side. The two forces exchange fire, with the winner determined by who gets the first

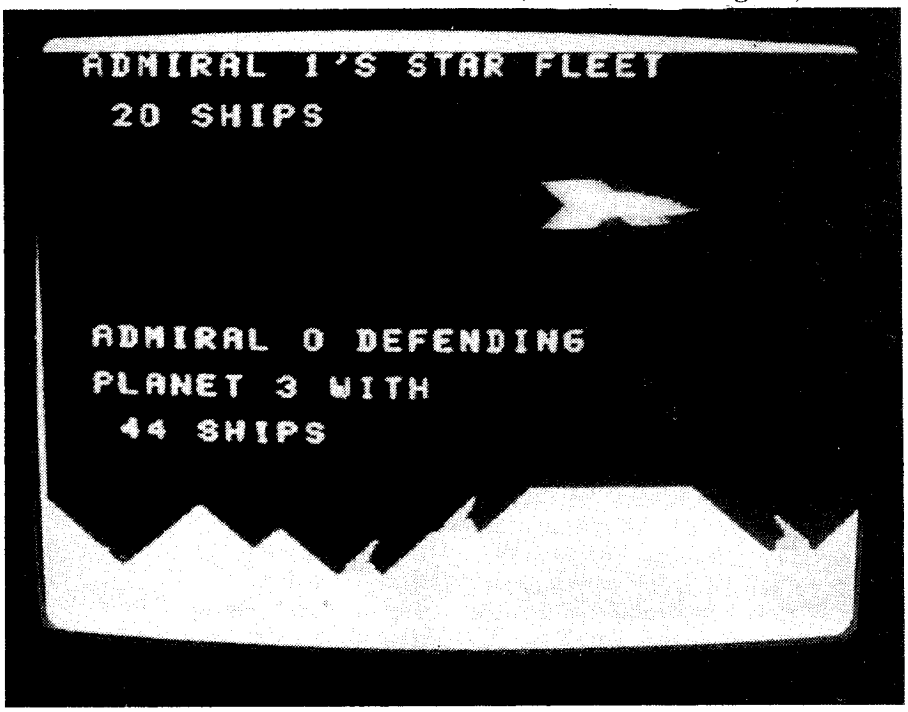
(Please turn to Page 20)

## Review

**Report Card**

| | |
|---|---|
| **Performance:** | **A** |
| **Ease of Use:** | **B** |
| **Documentation:** | **B+** |
| **Value:** | **B** |
| **Final Grade:** | **B** |

**Cost: $17.95 (diskette)**
**Manufacturer: EB Software, 12912 Villa Rose, Santa Ana, CA 92705**
**Requirements: console, monitor or television, disk drive and controller, 32K memory expansion, Extended BASIC cartridge, printer is optional**



# Galaxy

# ...or, rule the universe

Galaxy is Avalon Hill's second translation for the TI home computer. The first was the TI BASIC version of B1-Bomber. Galaxy is programmed to operate in Extended BASIC.

**Performance:** This multi-player space-strategy game operates much like Galactic Battle, which is reviewed elsewhere in this issue. The principal difference, aside from the fact that it comes on cassette and uses only console memory, is that it is easier to use and uses only one screen.

Game set-up includes provisions for loading a saved game, inputting the number of players, from one to four, the number of planets, from 5 to 26, four-letter designations for each player (each player has his own color, too) and the duration of the game, from 50 to 100 "months." Players may also decide whether to allow the computer to attack the participants and the frequency of the attacks. At the start of the game, each player has one planet while the others are owned by the computer, whether he is allowed to attack or not. The screen depicting the galaxy may be redrawn at the beginning until all players are satisfied.

The screen display is well-designed, using the upper two-thirds to depict the galaxy and the lower third to display input prompts and display the results of battles. Each planet is denoted by a letter from A to Z and a colored circle corresponding to its owner's color.

Players have a choice of several commands, which may be displayed on the screen at any time by pressing the "H" key. The commands include (L)aunch ships, (I)nspect planet, (C)alculate transit time and (N)o further orders. Other commands permit the user to reset the time limit, save the game, etc.

Each player starts out with a home planet and at least 100 ships. Ships are launched by pressing the

## Review

**Report Card**

**Performance:** ..... **A**
**Ease of Use:** ..... **A**
**Documentation:** ..... **B**
**Value:** ..... **B+**
**Final Grade:** ..... **B+**

**Cost: $16 (cassette)**
**Manufacturer: Microcomputer Games, 4517 Harford Rd., Baltimore, MD 21214**
**Requirements: console, monitor or television, Extended BASIC cartridge, tape recorder and cables**

"L" key and responding to the prompts for the source planet, the destination planet and the number of ships to send.

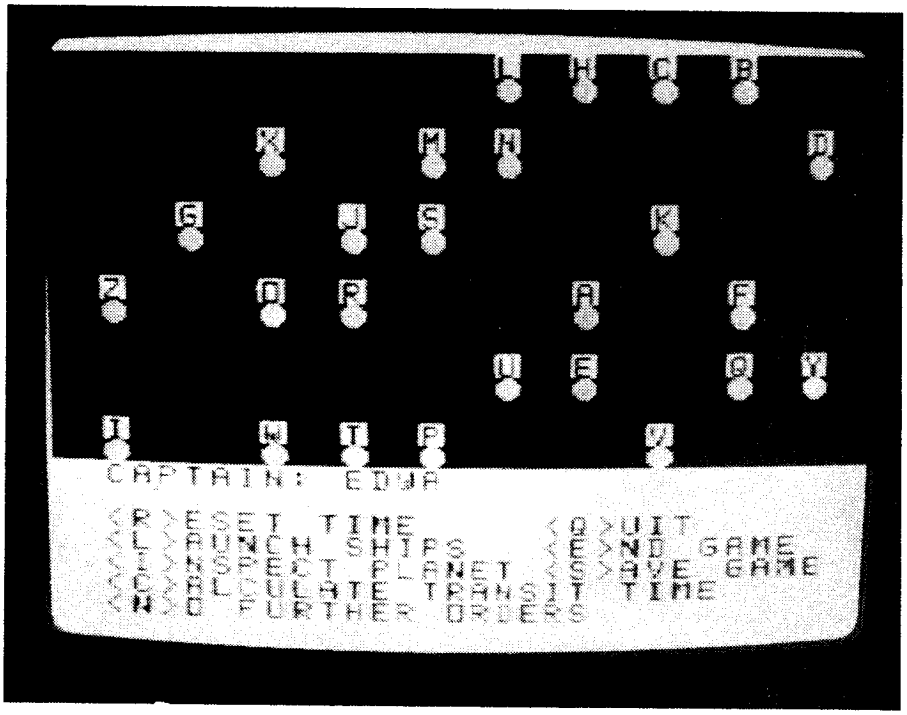
The Inspect command allows the user to review the status of selected planets that belong to him. This command reports the number of ships on the specified planet and the ship production capability (from 0 to 10) of the planet. The production capability refers to the number of ships the planet creates per turn. The more ships it creates, the more useful the planet is to a player since he can use the extra ships to create larger fleets with which to attack other planets.

The transit time command lets the player know how many turns it will take for a fleet to fly from one planet to another.

Sound is used to simulate battle sounds between turns when attacks are made. Beeps are used to indicate that a key has been pressed during input. The enter key is used only after all input for a particular move has been made. Each player may launch as many fleets as he likes during any turn. The "N" key is pressed to signify the end of a player's turn.

I have no major reservations about this game. It is well-implemented, considering that it is designed to run out of the memory available in the TI console. The

**(Please turn to Page 20)**



## TE-1200—

(Continued from Page 14)

out exiting the program by pressing CONTROL 1. However, this does not mean that one can log on to a telecommunications service at 300 baud and then change to 1200 baud. Neither CompuServe nor The Source allows this kind of change without signing off and logging on again.

File transfers worked quite well at 300 and 1200 baud. Although telecommunications services charge about twice as much for 1200 baud service than for 300 baud service, downloading and uploading is about three and a half times as fast at 1200 baud than at 300 baud. This can result in a real savings for those who routinely write files to disk or printer.

I found the auto-logging function to be very useful. This allows the user to automatically dump to disk all the data that crosses the screen. One can go through various sections of a telecommunications service very quickly in this way, writing the data to disk and reading the data at one's leisure after signing off.

One thing I don't like about TE-1200 is the fact that it double spaces all output to the printer. Line lengths depend entirely on the number of screen characters the user inputs when logging on to the telecommunications service, but line feeds seem to be generated by a program default. With a 12.5K buffer, dumping data can consume a lot of paper over the course of a single evening's telecommunications.

As a note to those who purchase this program to be used with a 1200 baud modem, the pin alignments probably will have to be modified before it will work with the TI RS232 configuration. Rather than having the pins modified on either the RS232 or the modem, I had a double-ended connector built for $15. All pin switching was done in the connector. This way, if I ever decide to sell the modem, I can do so without having modified it. Most off-the-shelf modems that I know of are not configured by the manufacturer to operate with the TI without a minor modification.

**Ease of Use:** Anyone familiar with how an RS232 port works will find this program to be easy to use. Everything is industry standard, as they say.

**Documentation:** The documentation that comes with TE-1200 consists of four pages that are stored on a file on the TE-1200 disk. It can be read using TI-Writer or the Editor/Assembler cartridge. It is very short on description, explaining only the barest facts that you need to get the program going. It is designed to be used only by those who are already familiar with terminal emulators. I must point out, TI did a bang-up job with the documentation that came with TEII.

**Value:** If you're looking for a 1200 baud terminal emulator, this is the only one in town. It does what needs to be done to send and receive data at 1200 baud. At this point, 1200 baud is the business standard for telecommunications. There are many things that are being done at 1200 baud that simply are not worth doing or cannot be done at 300 baud.

Until now, TI users have been locked out of many serious telecommunications applications. This program opens another door for TI users who are interested in moving forward in telecommunications.

—JK

**Only $4 Per Game**

Bit Byte Bit Software introduces beautiful and colorful games in BASIC, Extended BASIC and TI Assembly on cassettes or diskettes for $4 per game! In addition, there is ONE FREE GAME with any order as well as a FREE CATALOG. Write to:

**Bit Byte Bit Software, Inc.**
**P.O. Box 565**
**Coram, N.Y. 11727**
**(516)928-6538**

## TOWER—

(Continued from Page 16)

without colliding with incoming traffic. Not to mention the possibility that the landing gear of one of the planes on the ground will malfunction, blocking off access to one of the runways. Also, at level three, a terrorist may take over a plane soon after takeoff and demand to be returned to the airport immediately. And, of course, one mustn't overlook the possibility that a plane will run out of fuel. More than one game ended for me in the flameout and subsequent crash of a fuel-starved 727.

At all three levels, there is a storm cloud that passes across the screen, causing turbulence for those planes that cross its path. Also, the higher the level, the lower the weather ceiling and the less leeway you have in terms of runway approaches.

What can I say? It is fun to play.

Tower uses sound effects to indicate that input has been recorded and to indicate that a plane has landed or taken off. The radar screen provides a representational view of the area around the airport. The response to input, of course, is not immediate. You have to make sure that you firmly press the keys down or you'll likely get a "Transmission Garbled" response from the computer. Lest you not think this is serious business, the game also keeps score for you, displaying the results at the end, either after you've landed five planes successfully, had one crash or shortly after the fifth plane has taken off. Landing five planes, provided you've done it efficiently, will result in an "A." Any time a plane crashes, your grade automatically drops to an "F." Anything lower than a "B," the documentation cautions, is a poor grade.

**Ease of Use:** The game uses multiple keystrokes for input to identify the plane by its letter, the type of activity you want to initiate (direction, altitude, etc.) as well as the number to indicate how high or in what direction you want the plane to

(Please turn to Page 20)

# TOWER—

(Continued from Page 19)

go. This seems to be more difficult at the start than it actually is.

**Documentation:** Tower comes with a six-page manual that provides sufficient narrative to get the user ready to take over the tower.

**Value:** I enjoyed playing this game. I particularly appreciated the fact that the three levels differ in significant ways, and not just in the fact that things go faster as in many games. I became competent at level two fairly quickly, but failed to get any grade higher than an "F" at level three. I don't know how many times I said, "Just one more time," after seeing my failing grade appear on the screen.

-JK

# BATTLE—

(Continued from Page 17)

shot in as well as the difference between the strength of the attacking and defending forces. Generally, small fleets will fail to overcome defensive forces.

Patience is the key to galactic victory. The best strategy seems to be to take over nearby planets first so as to increase the production of vessels so as to be able to amass larger fleets for longer distance battle. At the start, the computer "owns" all the planets except those designated as home planets. Thus, no matter which planet you attack, there will be a defensive force stationed to try to repel you.

Further complicating matters for the would-be galactic conquerer are "star alerts." These occur randomly between turns and essentially represent a variety of hazards encountered by fleets during flight. They may consist of time warps that will delay arrival at the destination, or attacks by space pirates which will inevitably reduce the size of the fleet.

The graphics in this game are quite adequate, though I found some of the color schemes to be annoying. For example, the status screen which provides the data on all the planets uses blue for the characters on a black background. This is very difficult to read.

Sound is used to represent explosions during battles, which is appropriate. Jon Burt, who authored the game, says that expansion memory subroutines are used to control all the screen graphics and screen clears.

My principal reservation is that more was not done to speed up the game. Having to press the enter key each time you input a single command slows things down and increases the likelihood of mistakes, which means that the commands must be reinputted. Also, the battle scenes take up too much time for my taste, particularly in the latter stages of a multi-player game when 10 or more battles will be fought between turns. I'd much rather have simply been informed that the battle was fought, the strengths of the opposing forces and the outcome rather than having to sit through battle after battle. What makes this game enjoyable is the strategy that goes into playing it.

Although the game starts out with a one-minute, 45-second introductory sequence, users may forego this by hitting the space bar.

**Ease of Use:** Aside from the above reservation regarding the inputting of commands, this game is not difficult to play. However, novice players will probably not fare well in their first game. It takes a couple of tries before the strategic complexities are fully appreciated. I found that some players simply do not have an appreciation for strategy and tend to be defeated rather quickly while others, who do understand strategy, pick up on it quickly and are able to play rather successfully. This does not seem to have any bearing on age or sex, since preteens and women did as well as the men and teens who played it.

**Documentation:** The game comes with a 12-page manual that came close to answering all of my questions. Specifically, I would like to have seen a bit more description of "star alerts," particularly regarding their frequency, effects, etc.

**Value:** Those who have printers will appreciate the printer option of this game. The price is reasonable for what you get. This seems to have appeal for those who are inclined less to arcade action and more to the cerebral side of war making.

—JK

# GALAXY—

(Continued from Page 18)

screen display is easy to read and the color coding of planet ownership is a nice touch. I also like the fact that the user decides whether to let the computer play or not.

**Ease of Use:** This is an easy game to play, from the standpoint of input. The ability to call up a list of available commands at any time is very helpful. A minimum of keystrokes is necessary to input the commands for any move. People of all ages who played this game picked up on it right away.

**Documentation:** The documentation gives the basics for several versions of the game (Commodore, Radio Shack, IBM, Atari and TI). Although the company makes an attempt to allay criticism of the documentation by noting that it has been verified by Software Testers of Universal Microcomputer Programmers (STUMP), I think it is inadequate. For example, the documentation does not include any specific reference to the pregame selection of options. It is my opinion that documentation should reflect the software, and it is principally on this basis that I evaluate documentation. Sorry, STUMP.

**Value:** I enjoyed playing this game with the family. Everyone, regardless of sex or age, was able to participate. And it wasn't long before mom and one of the boys started to develop alliances to attack you know who.

-JK

# User Notes

## File converter

Trying to get a file written by one program to be read by another needn't be a cause for frustration. The following program takes the original file (written onto disk using TE-1200) and modifies the file characteristics according to the user's needs (in this case for use by TI-Writer). Here is the basic program, which runs in Extended BASIC:

```
100 REM DISK CONVERTER
106 INPUT "FILE TO CONVERT
    =":ABC$
107 INPUT "FILE TO CREATE
    =":DEF$
110 OPEN #2:DEF$,DISPLAY
    ,VARIABLE 80
120 OPEN #1:ABC$,DISPLAY
    ,VARIABLE 128
130 LINPUT #1:A$
140 PRINT #2:A$
145 PRINT A$
150 IF EOF(1)THEN 170
160 GOTO 130
170 CLOSE #2
180 CLOSE #1
190 END
```

Lines 110 and 120 are the most important at this point. The characteristics of line 110 (display, variable 80) matches the characteristics of a file created by TI-Writer. Line 120 loads a file written in display format with a 128-byte variable record length. Most of the actual work is done by line 130.

Suppose you want your file to be read by a program that requires internal format with a record length of 254 bytes. The procedure is a bit different, since LINPUT cannot be used with internal format files. First, you would modify line 110 to reflect the characteristics that you want your file to have:

110 OPEN #1: ABC$, INTERNAL, VARIABLE 254

Then you would have to change line 130 from LINPUT to INPUT:

130 INPUT #1: A$

Each record appears on the screen briefly as it is read. This is a particularly useful program to use with TE-1200 files because TE-1200 has an auto-logging feature that allows the user to dump all data that crosses his screen into a disk drive automatically. Terminal Emulator II will dump to a disk but only one screen at a time and only on operator command. This means that the user has to wait while the data is being written to a disk, using up valuable on-line time when using a telecommunications service such as CompuServe or The Source.

## Where's the error?

This tip comes from a column written by Don Mason in the Massachusetts Users of the Ninety-Nine and Computer Hobbyists (MUNCH) newsletter. It has to do with pinpointing the location of error messages generated by the computer.

Suppose you've just finished writing a program. You've saved a copy of it and now you RUN it. What happens? An error message is generated: DATA ERROR IN LINE XXXX. You look at the line referred to in the error message and it turns out to be a READ statement. Now you want to isolate the error. One way of doing it, according to Mason, is to change the READ statement to PRINT. Now when you RUN the program the error message that appears will tell you the last value that it read correctly, the next one being incorrect.

## Cassette to disk

How many times have you tried to load a lengthy program from cassette onto diskette and found that you couldn't do it? Once is too much. Here's a suggestion from the Airport Area Computer Club of Coraopolis, Pennsylvania, that should help.

First, the problem usually results when trying to load a long BASIC program. While the cassette program works fine without a disk system, plugging a disk drive into your console results in the loss of about two kilobytes of program space. The disk system requires this memory for system overhead.

Now, having said that, enter BYE, get into TI BASIC and enter a CALL FILES(1) command. Then enter OLD CS1 and load the program from cassette.

Now, delete a single line from the program. Choose a REM statement if possible, but write the line down for future reference. Next enter SAVE DSK1.(filename). After saving the program to disk, enter BYE again and load Extended BASIC. After getting into Extended BASIC, enter NEW then CALL FILES(1). Then enter OLD DSK1.(filename) to load the program from disk. Replace the line you deleted if you like and then enter a CALL FILES(3) command. Then enter SAVE DSK1.(filename) and save the program again. Then enter RUN.

Okay, what if the program will run only in BASIC? Follow this procedure: enter BYE, get into TI BASIC, load the program from disk and then enter RUN. If you get a MEMORY FULL IN LINE XXXX message do the following: enter CALL FILES(1), enter RUN, then enter SAVE DSK1.(filename). From now on you will have to enter CALL FILES(1) before loading the program from disk in BASIC.

Of course, these methods will not work if the program length exceeds the available memory. However, most BASIC programs written to cassette will be shorter than the 14.5 kilobytes available in console RAM.

## Lots of color

So you thought TI BASIC gives you access to only 16 colors. Not according to the Cin-Day Users Group of Cincinnati, Ohio. Here's a color demonstration program by Ed York that will open your eyes. (By the way, it runs perfectly well in Extended BASIC, too.)

(Please turn to Page 22)

# User Notes

(Continued from Page 21)

```
100 REM COLOR BONANZA BY
    ED YORK
110 REM CIN-DAY USER GROUP
120 REM TI BASIC
130 CALL CLEAR
140 FOR A=40 TO 136 STEP 8
150 CALL CHAR(A,"55AA55AA55
    AA55AA")
160 NEXT A
170 FOR B=2 TO 14
180 CALL COLOR(B,1,1)
190 CALL VCHAR(1,2*B,24+8*B
    ,22)
200 CALL VCHAR(1,2*B+1,24+8
    *B,22)
210 NEXT B
220 FOR C=2 TO 14
230 CALL SCREEN(INT(16*RND)
    +1)
240 FOR D=2 TO 14
250 CALL COLOR(D,D,C)
260 NEXT D
270 CALL KEY(0,E,F)
280 IF F<1 THEN 270
290 NEXT C
300 GOTO 220
```

## Win some software

Part of the joy of programming is the tinkering one does to make a program or routine just a little bit better, make it do just a little bit more than it originally was supposed to do.

Below you'll find a rudimentary score-keeping program that comes from the Los Angeles 99ers Users Group. What we want to see is what readers can do with it to improve it as a score-keeping program. We ask that you use no more than 1000 bytes. We will accept versions written either in BASIC or Extended BASIC (only one entry per person) on either cassette, diskette or printout. We will return all media if return postage and packaging is included. Include whatever documentation that is required for the program's use. The best BASIC and Extended BASIC versions will be published in a future edition of MICROpendium. Winners may select from the following programs, donated by the manufacturers. Please indicate your first and second choice when you submit your entry.

Here are the prizes, all of which have been reviewed in previous issues of MICROpendium: On Gaming, C.A. Root Associates; Void, Kean Computing Inc.; Thief, Tomputer Software; Mad-Dog, Data/-Ware Development Inc.; ASW Tactics II, DEJ Software; Monthly Budget$ Master, SA2 Software; Budget Master, TXMasters; Home Budget, DCH Software; and Escape from Balthazar, Inter-8 Enterprises.

**User Notes is a column of tips and ideas designed to help readers put their home computers to better use.**

**The information provided here comes from many sources, including TI home computer user group newsletters. MICROpendium will pay $10 for any item sent in by readers that appears in this column. Mail tips to: MICROpendium, P.O. Box 1343, Round Rock, TX78680.**

```
100 REM ***SCORE KEEPER***
110 CALL CLEAR
120 INPUT "HOW MANY PLAYERS
    ?":X
130 FOR PLAYER=1 TO X
140 INPUT "NAME ":PL$(PLAYE
    R)
150 INPUT "POINTS ":PTS(PLA
    YER)
160 PRINT
170 NEXT PLAYER
180 REM ***NOW ASK FOR PLAY
    ER BY NUMBER
190 PRINT :::"ENTER 0 TO QU
    IT":::
195 INPUT "PLAYER #":N
200 PRINT "_____"
210 IF N=0 THEN 250
220 PRINT PL$(N),PTS(N)
230 PRINT :::
240 GOTO 195
250 END
```

# Newsbytes

## TI addendum

Star Micronics, manufacturer of Gemini printers, has produced an addendum to its User Reference Guide that relates specifically to the TI home computer. Contact the company for more information or to obtain a copy: Star Micronics, No. 3 Oldfield, Irvine, CA 92714, (714) 768-4340.

## Rumors dispelled?

Is TI producing its home computer in Brazil? Has General Electric picked up the rights to produce a TI99/4A clone? These rumors have been making the rounds lately but, according to a TI spokesman, there's nothing to them. Actually, the spokesman indicated that he is not aware of any such activities. He provided MICROpendium with the telephone numbers of other TI executives who might be able to shed more light on the issue. Unfortunately, one of the numbers turned out to have been disconnected and the other was not answered despite repeated calls. We have yet to hear from our Brazilian correspondent.

## Pascal users

TI users who own the P-code card may be able to find some help with Pascal programming from a California group that supports the UCSD (University of California San Diego) Pascal system. Called the UCSD P-system Users Society (Box 1148, La Jolla, CA 92308), the group's library of programs is reportedly compatible with the TI. Membership is $25 annually. For more information, write them, making sure to indicate that you are a TI99/4A user.

**Newsbytes is a column of general information for TI99/4A users. It includes product announcements and other items of interest. The publisher does not necessarily endorse products listed in this column. Vendors and others are encouraged to submit items for consideration. Items submitted will be verified by the staff before inclusion and edited to fit the Newsbytes format. Mail items to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.**

# Classified

## Policy

Classified advertising is a unique feature of MICROpendium. The cost is 20 cents per word. Classified advertisements must be paid in advance. Classified advertisers may request a category under which they would like their advertisement 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 from 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.

## Software for Sale

**CASINO PROGRAMS**

JACKS & BETTER (just like the poker machines in Reno) and NEATO KENO (a Keno simulation program). Both in BASIC on cassette for $11.95 (includes handling, postage, tax if any). Send check or money order to: MOOSEGRIN, P.O. BOX 21624, SAN JOSE, CA 95151. n7

**TI-99/4A SOFTWARE**

125 programs available, only $3 each! Not public domain, not translations, not pirated, not brief routines, these are absolutely original innovative programs utilizing full color and sound capabilities of the TI-99/4A. Programmed in BASIC but XBASIC etc. often optional. Games, education, music, displays, programmers' aids, etc. Catalog $1, refundable. Tigercub Software, 156 Collingwood, Whitehall, OH 43213. n7

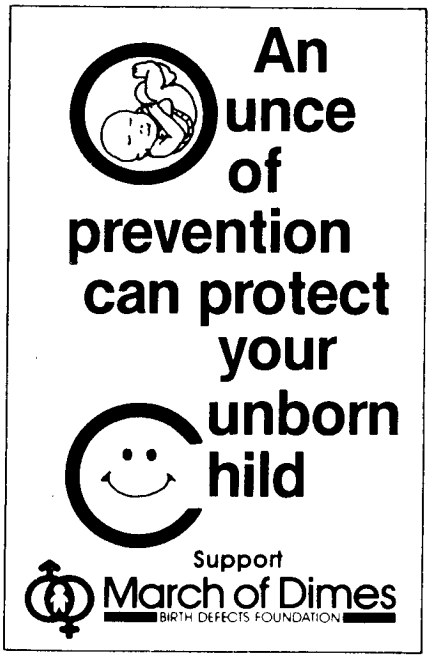
ASSEMBLY LANGUAGE SCREEN IMAGE DUMP program for the TI99/4 or TI99/4A. Can be used on any eight-bit dot addressable printer for Editor/Assembler, Extended BASIC and Mini-Memory. BUDGET-RECORDER in Extended BASIC on tape (16K) or disk (32K). TRAMPER pyramid game in Extended BASIC. Plus many more. Send for free catalog to BRIGHT MICRO KOMPUTERS, 2781 RESOR ROAD, FAIRFIELD, OHIO 45014. n8

**TI99/4A SOFTWARE PACKAGE**

SuperSpeller, Word Scrambler, Math Quizzer. All for $10 cassette, $13 disk. TI BASIC, Speech Synthesizer and TEII optional. Price list $1. **Soft Relations**, P.O. Box 647, Patton, CA 92369-0647. n7

**LABEL PRINTER**

A software program to address an envelope and print labels in any of three fonts: enlarged, regular and condensed. Will do same in double-strike mode. Requires RS232, disk drive or cassette recorder, printer, Extended BASIC. Send $15.00 to K&K Software, P.O. Box 14322, Clearwater, FL 34279. n8




**The Best TI99/4A Software Bargain**

140 terrific cassette programs only 50 cents each! Hours of enjoyment. An exceptional value. Your best software buy! Free catalog. THE EXCHANGE, HCC-5, P.O. Box 46, Sterling, VA 22170. Phone (703) 435-2789. n13

**ENTERTAINING EDUCATIONAL SIMULATIONS** for the TI99/4A.

VYGER—Use your space ship to explore this realistic and accurate model of the solar system. An excellent , educational graphic adventure. (disk, 32K, Extd. BASIC)

HEART ATTACK—Use blood and nerve cells to regulate 20 controlling mechanisms while defending against attacking germs. Outstanding graphics. A detailed simulation and an endlessly exciting game.

$19.95 each + $1.50 shipping. 24-hour Visa and MC orders accepted. Shipping within 24 hours. INTELLESTAR (301) 251-0046. 25 West Middle Lane, Rockville, MD 20850. If simulations are your game, Intellestar's the name. n7

**ARRO-SOFT SYSTEMS**

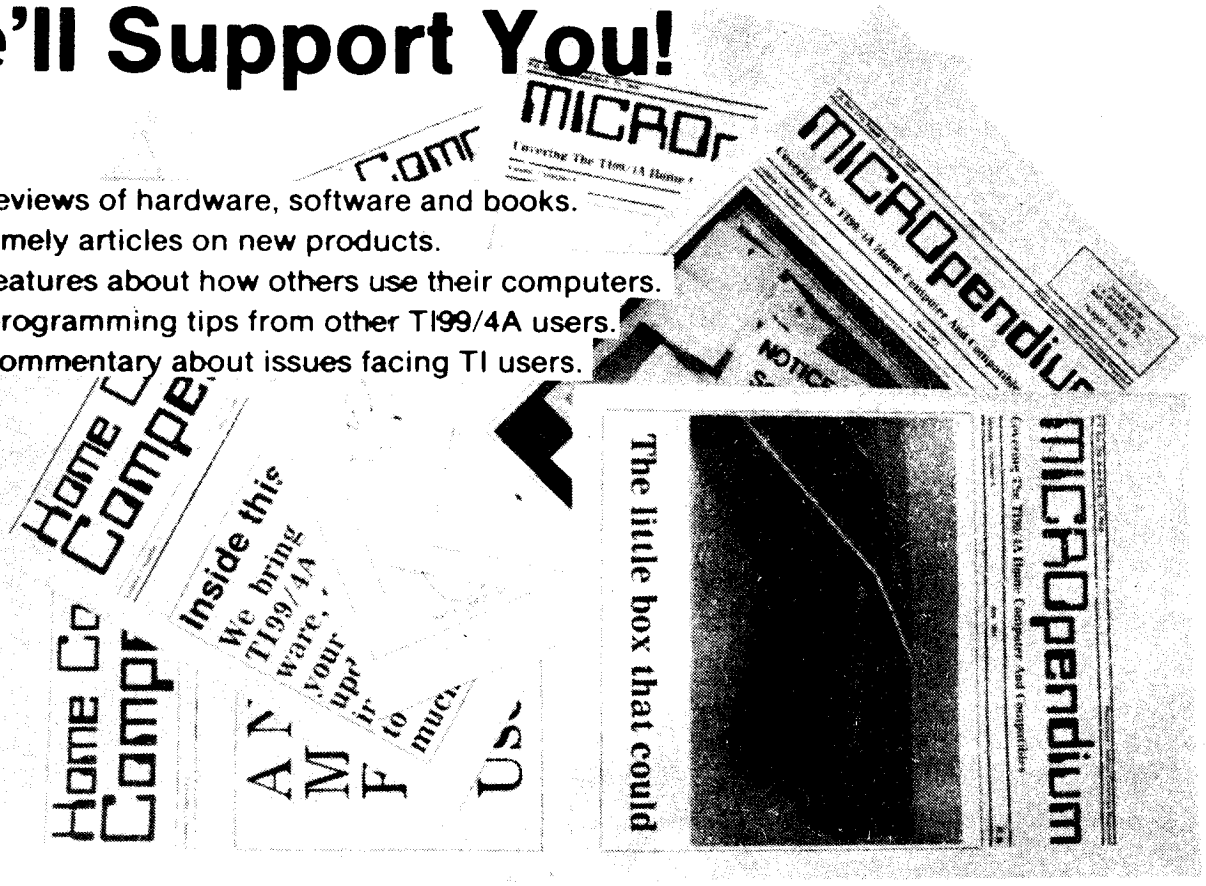
Quality TI99/4A Software. CREATE-A-FILE for Data Base and Mailing List Management. TEACHER'S RECORD grading programs. Try our Educational package: SPELLING TUTOR, STUDY BUDDY and CONCENTRATE. All three for $12 Cassette, $15 Disk. Send for free Catalog. ARRO-SOFT SYSTEMS, P.O. Box 1761, Edmond, OK 73083, (405) 341-8567. n7

# MICROpendium

Covering The TI99/4A Home Computer And Compatibles

## We'll Support You!

—With reviews of hardware, software and books.
—With timely articles on new products.
—With features about how others use their computers.
—With programming tips from other TI99/4A users.
—With commentary about issues facing TI users.




## SUBSCRIBE NOW! Return This Form

We cover the TI home computer. Period. If you're looking for timely product information, reviews, programming hints and more, all about the TI99/4A, then we're for you. A subscription is only $12 U.S. funds (add $3.50 for postage in Canada) for 12 issues per year. Give us a try. You can cancel at any time and we will refund the balance of your subscription.

Send me the next 12 issues of **MICROpendium**. I'm enclosing a check or money order for $12 (U.S. funds) for my subscription. Mail to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

**Name:** _____

**Address:** _____

**City:** _____

**State:** _____

**ZIP:** _____

7