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(See page 12)

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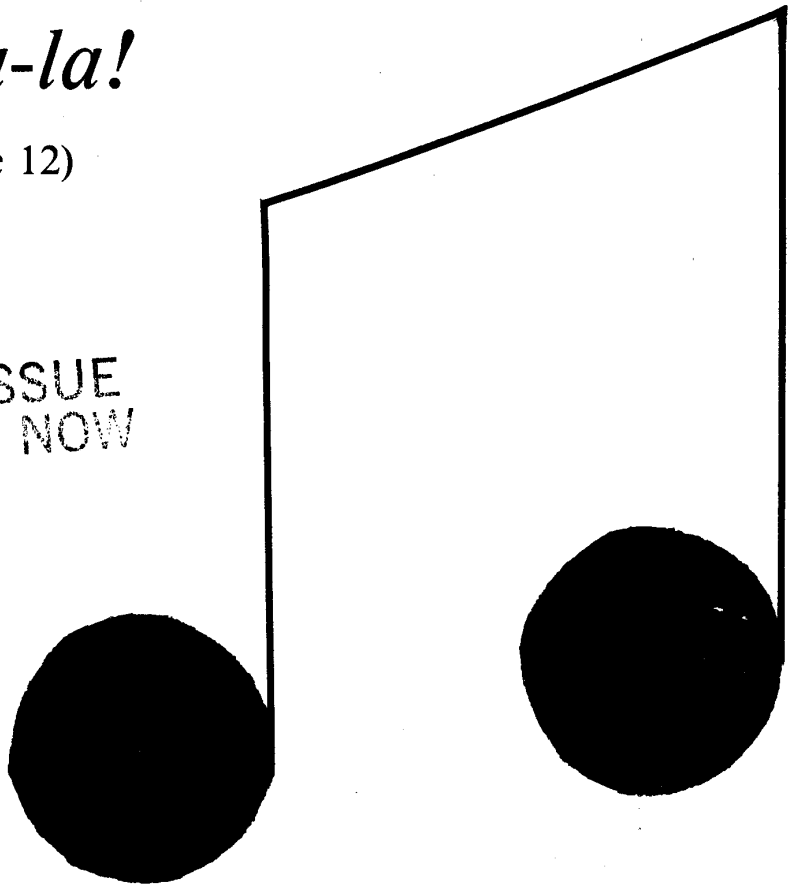

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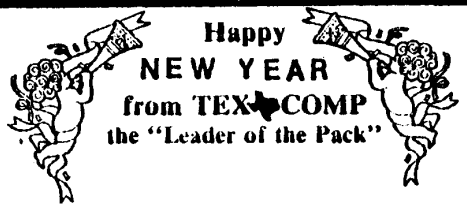

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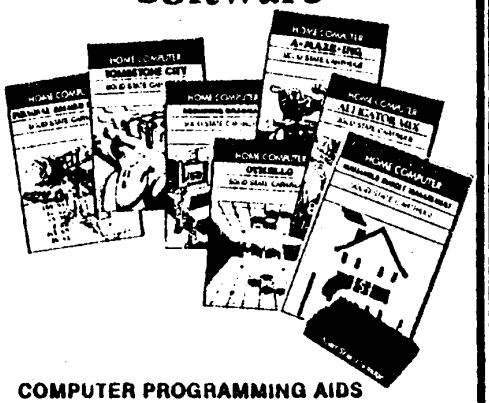

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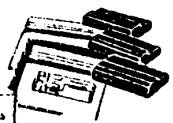

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Coming next month

—Languages for the TI
—A look at the GRAM Kracker
—Proofreader program

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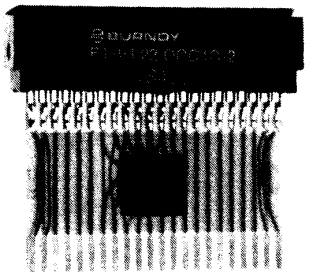

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Comments

Comings and goings

All of a sudden there is GRAM Kracker from the U.S.A., GRAM Karte from Germany and MAXIMEM from Canada. All three of these devices have reached the market at the same time, and all three do similar things.

These devices allow users to dump the contents of cartridges into memory and save them to disk, or back to the cartridge or, in one case, to cassette. While the contents of cartridges are in memory, the user may make modifications. In short, the knowledgeable user may customize cartridge-based software. You say you don't like the color scheme in Extended BASIC? Now you can change it. You want to have TI-Writer, Microsoft Multiplan, Disk Manager II, Editor/Assembler and a couple of games available in memory to be run at the press of a key, well, these babies will allow you to do it.

These products signal the beginning of a new direction for their owners. Similar to so-called "PROM busters," they have some vendors worried. Atari managed to close down one such product several years ago, though it's only purpose was to take the contents of a cartridge and dump it to a disk. These new products allow the user not only to dump the contents of a cartridge but to modify it.

I would anticipate seeing a lot of hybrid Disk Manager II programs floating around in the future. Look for hybrids of other programs as well. Perhaps the limitations of such cartridges as Personal Record Keeping will be eliminated, and in that case look for the modified versions to appear across the country. I don't believe that users will be dumping the contents of cartridges to disk just to pass them around to friends. Let's face it, most people already own the cartridges they really want. Besides, the prices have gone as low as 99 cents each for some cartridges, which is less than the cost of even a generic floppy disk.

I feel that the biggest change that we will see as a result of these new devices is a multitude of improvements to existing software. And I don't think anyone can be against that. (One improvement I'd like to see is the use of macros by TI-Writer.

BASIC COLUMN TO START

We expect to start publishing a BASIC programming column with the next issue. Several extremely able programmer/writers have offered their services, and anyone of them is capable of doing a superb job.

FLIGHT SIMULATOR IN THE WORKS

The word is that TI users may see a sophisticated flight simulator program in the not-too-distant future. Actually we've heard of two of the programs under development, on of which is supposed to be 100 percent assembly language The author of this program isn't prepared to go public a this point. We'll let you know when it's ready to fly.

WE WILL MISS FOUNDATION

The loss of Foundation Computing will be felt by many TI users. The company has left the market, but will continue to support its products (see article elsewhere in this issue) They produced good products, but I think they expected too much from the Z80A processor card. There just isn' enough really good CP/M software and support to make i viable, compared to, say, a PC or Apple co-processor card CP/M is fine for business applications to some extent, bu the vast majority of TI users use their computers at home for business, education and recreation. And CP/M-based software never did cut it in the education or recreation markets. Bill and Kathy Hunter worked hard to support the TI market and we wish them the best of luck in whatever they do next.

DANIEL NORLING

We were saddened to learn of the recent death of Danie Norling, an active member of the LA '99ers and a person with whom I had corresponded on The Source. We had listed his address for his Freeware program Proofreader i our November issue. We plan to print the entire program i the near future, probably next issue.

PART IV DELAYED

We are interrupting the next installment of Mack McCormick's assembly language tutorial. Unfortunately, we are missing a number of sections of the fourth installment of the tutorial and are waiting for another copy from Mack. Since he's in Germany, it takes a while. We expect to get back on track in the February issue. We apologize for the inconvenience.

OUR SECOND ANNIVERSARY

This edition marks the end of our second full year of publication, and next month we will start on our third. At times it seems that we should be surprised that we are still here, with more pages than ever. The TI99/4A has been out of production for as long as we've been in production, and yet we've got more subscribers now than we have had at any time in our history. And we continue to add new readers every day. We will never reach the entire TI community, bu it is a privilege to serve the readers we have reached. Many have very kind things to say when they write us. Unfortunately, we are unable to respond to most of our readers on an individual basis, but let me assure those who are reading this that your messages really make our day.

—JH

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The ***SST*** *EXPANDED BASIC COMPILER* package translates a Basic program into TMS9900 machine language, resulting in a great gain in program execution speed. The compiled commands are up to 160 times faster than the corresponding commands in *TI BASIC* or *EXTENDED BASIC*. For a comparison we used our Compiler to run the benchmark program for making change in the April 1984 MICROpendium. This program takes over 30 minutes in *TI BASIC*. When the program was compiled using the ***SST*** *EXPANDED BASIC COMPILER*, the program ran in 37 seconds. In fact, you can compile the program, save it on a disk, recall it, run it and still be considerably faster than *TI BASIC*.

A second benchmark program appeared in the November 1984 issue of the MICROpendium (page 22). This program took:

209.4 seconds in *TI BASIC*	7.2 seconds in *TI FORTH*
219.6 seconds in *TI EXTENDED BASIC*	4.9 seconds in *WYCOVE FORTH*

2.5 seconds in *SST BASIC* or *EXPANDED BASIC*

The ***SST*** *EXPANDED COMPILER* is also many times faster than *TI PASCAL*.

The ***SST*** *EXPANDED BASIC COMPILER* contains most of the standard features of *EXTENDED BASIC* and is especially useful for number crunching, text manipulation and for producing arcade type games. However, some translation of a Basic program may be required.

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Feedback

Just exchange it

I had a similar problem to that of Darrel Sparkman (October 1985 Feedback). I also couldn't get my second drive to work as DSK2. My drives would only run when configured as either DSK1 and DSK3 or DSK2 and DSK3. I tried different cables and switch settings. Nothing helped. I also own a "stand alone" disk controller which I installed between my computer and PE box. The second drive now worked as DSK2. There must have been something defective with my controller card all along. I exchanged my card for another at a TI exchange center for $47. My new card works fine with DSK1 and DSK2.

Brian McFeeters
Morton, Illinois

More on drives

To Darrel Sparkman of Lockwood, Missouri (October '85 Feedback), the problem with the second drive only being accessed as DSK3 can be caused by a couple of things. TI attempted to make connecting extra drives as simple as possible. To do this they modified the drive cable jumper boards to rotate the drive select lines. This requires all drives to be set for DS0 on the drive selection header (the jumpers located on the board inside the drive). If one jumper board is used between the disk controller and a drive (i.e. two cables), the address becomes DSK2. If two jumper boards are used between the disk controller and a drive (i.e. three cables), the drive becomes DSK3. If I understood correctly, you are using the latter configuration. You could use only two cables with one jumper board, or get one long standard disk cable and change the drive selection header by removing the DS0 jumper and adding one in the DS1 position. Either should solve your problem.

The TI PEB power supply for the internal drive is capable of handling approximately one amp on either the 5-or 12-volt lines. Unfortunately, the typical full-sized drive draws from .9 to 1.8 amps at 12 volts and from .5 to .7 amps at five volts according to the manufacturer's specifications. Thus, without modification the power supply won't handle two full-sized disk drives.

Usually the PEB will handle two half-height drives without problems. However, some of the PEBs were assembled using non-TI 12-volt regulators. There have been some problems with these regulators failing. Typically the 12-Volt level starts to degrade, causing the drives to act erratically. This can usually be solved by replacing the 7812 (TO-3) regulator with a TI part or even with one in a TO-220AB case if a proper heat sink is used.

If the 12-volt line is not at a low voltage, I understand that the repair center has been installing electrolytic capacitors between the 12-volt line and ground at the disk drive power plugs in the right hand side of the PEB. The value of the capacitor is around 500 uF. This supplies some of the current required under disk spin-up conditions.

Wayne Rettig
Lubbock, Texas

Schematics source

In your November issue a Sam P. Smith from Lubbock, Texas, wanted a set of schematics for a S 400 L drive, PHP-1250

He can get one from Hamilton Avnet Elect., main office 4545 Viewridge Ave., San Diego, CA 92123. Also offices in Texas: 8750 Westpark Drive, Houston, TX 77063 and 2401 Rutland Drive, Austin, TX 78758. I just purchased a service manual from them about 1½ months ago.

Barbara Andrews
Onset, Massachusetts

Speak & Spell fix

In response to Ed Mashburn who is having trouble with Speak and Spell, if he has Extended BASIC, then change the program to read:

95 ON ERROR 95 :: RETURN NEXT

It will work perfectly with XB with only a slight difference in execution speed.

David Strimple
Roslindale, Massachusetts

Trip explained

In response to Gary Cox of Memphis in the October 1985 issue—Gary, in TI BASIC the program is stored in VDP RAM. When you ask the interpreter to set aside that much memory it exceeds slightly into an area of the VDP RAM that holds special information regarding character definitions and the like interfering with the normal operation of things. Review a memory map and you'll see what I mean. The same kind of thing occurs if you ask a program like TI's Debug to write a value to a memory location above the top limits of VDP RAM.

Eric R. Benton
Waterville, Maine

Names suggested

Lou Phillips, president of Myarc, says he is looking for a name for his NEW computer and wants something that is a play on his firm's name. The firm's name is Microcomputer Architects so may I suggest that he use the two first letters and call it "MA"; this could either stand for Much Arrogance or represent the cry by a child for help.

A review of his firm's recent customer relations would reflect the following: 1) TI hardware manufacturers, software producers and computer users seem to be pulling closer together while Myarc products seem to be increasingly incompatible with all three; 2) his much touted Extended BASIC upgrade has missed more shipping dates than an IBM new product, and Myarc isn't Big Blue, plus at the Chicago Faire he "forgot" a diskette necessary to demonstrate this item (one has to wonder if he has never heard of door to door for $10 Purolator Courier or didn't he think the Faire attendees were worth

(Please turn to Page 10)

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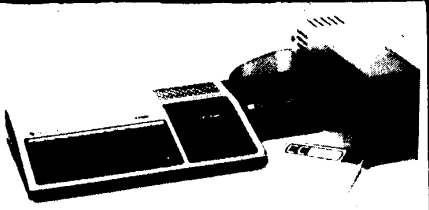

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Feedback

(Continued from Page 8)

$10?); 3) did you look at the NEW computer's motherboard in Chicago?—one has to wonder what many of the unconnected chips were doing and where were the memory chips or space for them (perhaps that THING has artificial intelligence); 4) should one mention the fiasco at the June Computer Electronics Show where Lou and the NEW computer were supposed to be?; 5) could one mention the fiasco of the November Chicago Faire where Lou and the NEW computer were supposed to be?

It would seem that the most appropriate name for the NEW computer would be TIME, since it and the NEW computer's introduction date seem to do nothing but move on.

Fred DuVall
Clinton, Arkansas

Parts and memory

I was advised by TI that the Parts Department is moving and will have a new phone number after Dec. 26: (806) 741-3064.

There still seems to be some confusion about the memory capacity of the TI99/4A. Please note:

VDP RAM	16K
GROM	48K
ROM 0	8K
RAM 2	8K
IO Bank 4	8K
Cartridge Bank 6	8K
Ram A,C,E	24K
Total	120K

Also RAM 8300-83FF, 128 words. Rest of Bank 8 not useable.

Merle Vogt
Von Ormy, Texas

TINYCAL errors

My TINYCAL program appeared in your October issue and many people have sent comments or requested the Freeware CALENDAR disk with six other calendar programs and documentation. Only one person (Jack Wittman, Sherborn, Massachusetts) had discovered that one of the equations I used was incomplete causing dates before 1901 to be incorrect. Jack did some calendar research on his own and came up with a fix that works for all years after 1582. The fix I've used is different but gives the same results. The correction involves changing the equation DI = (Y-1906)-INT(Y-1901)/4 to:

DI = (Y-1501) + INT((Y-1501)/4) + INT((Y-1)/400-INT((Y-1/100). The four terms of the equation do the following: term 1 adds one day for every year that passes; term 2 adds one day every four years to correct for common leap years; term 3 adds one day every 400 years to correct for century years that are leap years (1600, 2000, etc.); term 4 subtracts one day every 100 years to correct for century years that are not leap years (1700, 1800, 1900, etc.).

I hope the error hasn't caused anyone any inconvenience.

If Bill Myers got his TINYCAL program to work by changing the data in line 200 from 32,30 to 31,30 as he says (December 1985, page 51), he has got to be one amazing programmer! "As we all know" by inspecting line 190 the data entries are read in groups of three.

The first, T(I), is the TAB value to center the name of the month above the days on the printout followed by the number of days in the month, D(I), and the name of the month, MO$(I). That is why odd months have low values (6-9) and even months which are printed on the right-hand side have high values (30-32) for the first data entry in each group of three.

Using Bill Myers' logic that erroneously assumes the number following the name of the month is the number of days for that month, October has seven days and December has none! Changing the numbers on line 200 that are immediately to the right of March affects the TAB for April and has no effect on March!

The data lines are correct and if they are entered properly they will work. Line 310 is correct as stands but does require some basic programming tricks to enter as it is over 140 characters long. When I sent the disk to you, I didn't anticipate you would call to ask about printing one of the programs on the disk. If I had I would have made line 310 into two lines.

Richard J. Bailey
Gonic, New Hampshire

CorComp repair work

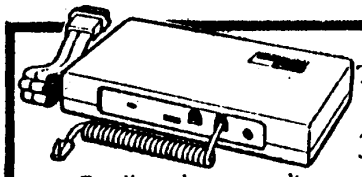
In the December issue of *MICROpendium* on page 47 there appeared an article entitled "CorComp Card Repairs." This is the first I was aware that Cleland Controls was advertising the repair of our products.

It is important that your readers are aware that Cleland is not authorized by CorComp and that we have not provided them with any technical information for our products. It is also important that customers realize that CorComp as the original manufacturer will not support any work done by an outside service company. Any work performed by any such companies will void and nullify any existing warranties.

As you know, our service policy for out of warranty products is $50 which includes repairs, test, **any up-grading necessary,** complete service documentation, an extended 120 day warranty and technical support. I believe that it is important for anyone considering service by the Cleland Corporation to understand that the difference between the two sources of service is far more significant than the $15 difference.

Jackirae Sagouspe
CorComp
Anaheim, California

The Feedback column is for readers. It is a forum to communicate with other readers. The editor will condense excessively lengthy submissions where necessary. We ask that writers restrict themselves to one subject for the sake of simplicity. Our only requirement is that items be of interest to persons who use the TI99/4A home computer. Mail Feedback items to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.



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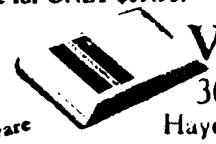

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Digital music

Digital Music by Stephen D. Peacock of Jacksonville, Florida, is designed for would-be computer composers and others who would like to use their consoles as musical instruments.

Digital Music consists of several programs that allow the user to create and play musical pieces. The program allows the user to test his compositions as they are created and to recall them as often as necessary to perfect them. It requires Extended BASIC and a disk system.

The six programs included with Digital Music are called HELP, LOAD, MAKE, PIANO, STAFF and WORK. Copy them from the listings published here and save them to disk under these names. The programs called MAKE and WORK are identical so save it twice under the names MAKE and WORK.

The main menu consists of five options:

1. Instructions
2. To Play Music
3. To Compose A New Song
4. To Add to "Work" File
5. Print Numbers On Staff

The HELP program consists of instructions to operate the program. Much of this text is taken from the HELP program. Option 1 loads this program.

The second option controls the program called PIANO. This program controls the playing of the music. PIANO corresponds to Option 2.

The MAKE program corresponds to Option 3 and is used to compose music.

Option 4 also accesses the MAKE program. Both Option 3 and 4 utilize a fourth program called WORK, which is used to hold data while you are creating and testing a song.

PIANO

When PIANO is run you will see a picture of a piano with a message to "PLEASE WAIT, I AM STUDYING MY MUSIC." This pause is needed to calculate the values of several arrays. When these values are computed, a menu will appear. This menu consists of the following options:

AGAIN--------1
NEW----------2
END/COMPOSE--3
INDEX--------4

To play a song select NEW. You will be asked for the title of a song that has been saved. The prompt "DSK1." will appear. Just type the name of a song and press enter. It will run and play. If you enter an incorrect name you will get the message "DEVICE CAN NOT BE ACCESSED" and you may try again.

To play the same song again, select AGAIN. The song will be repeated.

COMPOSING

To compose a song you must enter the total number of notes you will use in a DATA statement, as well as the duration you want the notes to be played and numbers to correspond to the notes. Digital Music requires three numbers for each note (which are played in chord-like fashion). If you want to have a series of six notes or chords assigned to a single DATA statement the first entry in the DATA statement would be the number 6, followed by a comma, of course. Then you would enter the duration of the first note or chord, followed by a comma, and the three numbers corresponding to the three notes that are required by Digital Music. Here is an example:

490 DATA 3,300,20,20,20,300 ,2,21,25,300,3,22,26

Three notes would be played for 300 milliseconds each, consisting of sounds created by the numbers 20, 20 and 20; 2, 21 and 25; and 3, 22 and 26.

You may string as many of these combinations together as you can per DATA statement, just make sure that the first number is equal to the total number of chord or note sequences. Of course, you may use as many DATA statements as it takes to compose your song.

Data is entered using the MAKE program, which can be run from the main menu, the start of this program or by running DSK1.MAKE from a cold start.

Each note corresponds to a position on a musical staff. The lowest is C, which is equal to 110 hertz. C is given the number 1. The next note, C sharp, is 2, with D being 3. D sharp/E flat is 4. This is continued for a total of 45 half steps, up to the G sharp above the treble staff.

To enter a sharp give the next higher number. For example, if F is equal to 6 then F sharp is equal to 7. A flat uses the next lower number. For example: if B is equal to 12 then B flat is equal to 11. To play a rest enter the number 46. This has been assigned a frequency of 44000 hertz.

The duration of the note is entered in milliseconds; 300 is equal to 300 milliseconds.

When the compose option is selected the file DSK1.MAKE will run. You will see the prompt RUN/TEST/BREAK/SAVE. These options are activated by entering the first letter of the one you want to use—R, T, B or S. It is here that the information about DATA statements above is put to work. You would select

(Please turn to Page 14)

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DIGITAL MUSIC—

(Continued from Page 12)

"B" when writing a song. This will BREAK the program. You will be prompted to start entering data at program line 490. Simply enter NUM 490 and you can start entering musical data.

After the data has been entered, enter RUN. When the prompt line reappears press "T" for TEST. This will read your data and print it to the screen. You will be able to see if you have entered the data properly. If not, it will inform you of your errors. Hold any key to stop the listing. Release the key to restart.

After the data file has been tested select "S" for SAVE. The program will end and prompt you to save the file as DSK1.WORK. If it's saved in this way it can be run from the main program or from the start of the make program. The DATA statements will be intact and you can add to or change them. The file DSK1.MAKE will still be available to create a different song. Please note that only one WORK file may be run from this system. If you want to work on more than one song at a time, save them under other names. You will then need to run that file from a cold start.

After you have tested and saved your data, select "R" for run. The PIANO program will then run, and you may listen to your new composition.

To see all of the songs that you have saved to disk, select 4 for INDEX. Every song that has been saved with the MAKE program will be listed. Press enter to step through all of the titles. At any time you may press "Q" to quit, and return to the menu.

That should be enough to get you started on the road to composing with Digital Music.

(See program, Page 16)

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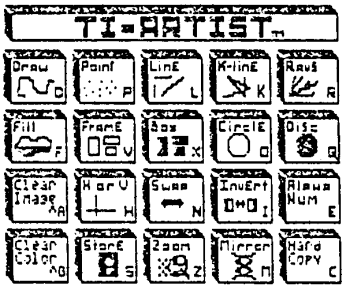
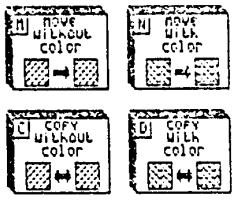
Multiple Character
Multiple Font Entry



Move, Copy and Flip

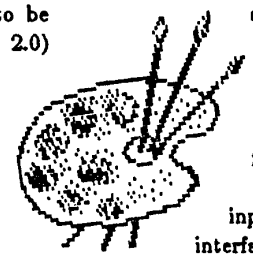


User Defined Picture Areas

TI Artist allows the user endless possibilities many unique features. The picture oriented menu's (shown above) are easy to use and informative. TI Artist provides excellent user adjusted screen image dumps that work with Okidata 92 or 93, Epson, Axiom GP-100 and Prowriter printers. Minimum system configuration required: Disk system, 32K memory exp, and either E/A, MM, XB, TI Writer, Cor Comp disk manager or Myarc disk controller card.

Artist's Companion

Artist's Companion is a complete package that adds a complete set of graphic tools to be used in conjunction with TI Artist (V 2.0) to help aid in graphic picture design. A set of five (5) single sided, single density diskettes include 25 character fonts, 160 5x5 (pixel) original graphic characters and 30 assorted pictures (instances). Artist's Companion is a must for designing almost anything, including ads like this one! A truly great value.



Artist Extras

Artist Extras is a small, but complete set of graphic tools to be used with TI Artist (V 2.0) to help aid in graphic picture design. Totally differnt from Artist's Companion, Artist Extras include 14 character fonts, 5 assorted pictures (instances), 6 full screen pictures and complete input device DSR routines to aid in interfacing a mouse and Super Sketch pad device. All this comes packed on a "flippe" disk and is a must for the TI Artist owner.

Companion $17.50
Extras $6.95

Texaments
53 Center Street
Patchogue, NY 11772

TI Artist $19.95
All Three $41.95

All orders shipped in 48 hours upon reciept. Add $1.50 postage and handling for each item ordered. Sorry, no C.O.D. or credit card orders accepted. Prices and availability subject to change without notice. Call our office (516-475-3480) or bulletin board service (516-475-6463) for additional information. We support a full line of TI-99/4a and IBM PC products. Quantity discounts available.

HELP

```
90 REM ***HELP***
100 CALL CLEAR
110 PRINT "      'DIGITAL MU
SIC'": : : :
120 PRINT "BY STEPHEN D. PEA
COCK.": : : : : : : : : :
130 GOSUB 1040
140 PRINT "DO YOU WANT:": :
:"1. INSTRUCTIONS":"2. TO PL
AY MUSIC":"3. TO COMPOSE A N
EW SONG":"4. TO ADD TO THE '
WORK' FILE":"5. PRINT NUMBER
S ON STAFF"
150 PRINT : :"SELECT 1-5"
160 CALL SOUND(200,999,0)
170 CALL KEY(0,K,S):: IF S=0
 THEN 170
180 IF K<49 OR K>53 THEN 170
190 K=K-48 :: ON K GOTO 260,
210,220,230,240
200 IF K=1 THEN 260
210 IF K=2 THEN RUN "DSK1.PI
ANO"
220 IF K=3 THEN RUN "DSK1.MA
KE"
230 IF K=4 THEN RUN "DSK1.WO
RK"
240 IF K=5 THEN RUN "DSK1.ST
AFF"
250 GOTO 170
260 CALL CLEAR :: PRINT "THI
S SYSTEM CONSISTS OF     SEV
ERAL SEPARATE PROGRAMS.  THE
 FIRST SECTION IS THIS   FIL
E ON HOW TO USE THIS SYS-TEM
."
270 PRINT :"THE SECOND IS TH
E MAIN SEC- TION, WHICH CONT
ROLS THE    PLAYING OF THE M
USIC. IT IS TITLED 'PIANO'.
THIS WILL   RUN WHEN OPTION
TWO IS"
280 PRINT "CHOSEN. THE THIRD
 IS A FILE THAT IS USED TO C
OMPOSE      MUSIC. IT IS TITL
ED 'MAKE'. THE FOURTH IS CAL
LED 'WORK'.IT IS USED TO HOL
D DATA"
290 PRINT "WHILE YOU ARE TES
TING YOUR  SONG. BOTH THE TH
IRD AND    FOURTH SECTION WI
LL RUN WHENTHAT OPTION IS CH
OSEN."
300 GOSUB 1040
310 CALL CLEAR :: PRINT "INS
TRUCTIONS FOR USING THE  MAI
N SECTION:": : :"'PIANO'": :
 : : : : : : : : :
320 GOSUB 1040
330 CALL CLEAR :: PRINT "WHE
N 'PIANO' IS RUN YOU WILLSEE
 A PICTURE OF A PIANO    WIT
H A MESSAGE TO 'PLEASE   WAI
T, I AM STUDING MY MUSIC'THI
S TIME IS NEEDED TO"
340 PRINT "CALCULATE THE VAL
UES OF     SEVERAL ARRAYS. W
HEN THESE  VALUES ARE COMPUT
TED A MENU WILL APEAR. THIS
CONSISTS OF'AGAIN>1 NEW>2 EN
D/COMPOSE>3INDEX>4": :
350 PRINT "TO SELECT ANY ONE
 OF THESE  OPTIONS JUST PRES
S THE NUM- BER OF THE SELECT
ION THAT   YOU WANT."
360 GOSUB 1040
370 CALL CLEAR :: PRINT "TO
PLAY A SONG SELECT OPTION'2'
 FOR NEW. YOU WILL THEN  BE
ASKED FOR THE TITLE OF A SON
G THAT HAS BEEN SAVED.   THE
```

(Please turn to Page 18)

TI-994A ⟶ IBM-PC ? PEP!

The problem

You have a 99/4A. You've had it for some time, and there is a lot of very valuable data stored on its diskettes.

You've also just acquired an IBM PC.

You want to transfer your data to the PC. As soon as possible, and as painlessly as possible.

The solution

You need ***PEP.***

PEP is a simple, inexpensive, universal technique for reliably and easily transferring data from your 99/4A (or almost any computer) to an IBM-PC. While virtually any application is running on the transmitting computer.

PEP stands for "Printer Emulation Package." Briefly, ***PEP*** is an advanced software product which will make your IBM-PC look like a printer to whatever computer is attached to it.

So, if you can print it, you can move it to your PC. It's that easy!

Available now !

Good news — ***PEP*** is available right now. And it's deceptively inexpensive: $59.95 in U.S. funds ($79.95 Canadian), plus $5.00 S&H. WRITE or PHONE for our free brochure !

PEP *is a product of* **INTELPRO** *(514) 656-8798*

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

NEW FROM TEX-COMP

AT LAST—A COMPLETE PRINT SHOP PACKAGE FOR THE TI-99/4A

Now create your own newsletters, advertisements, signs and greeting cards with this new package.

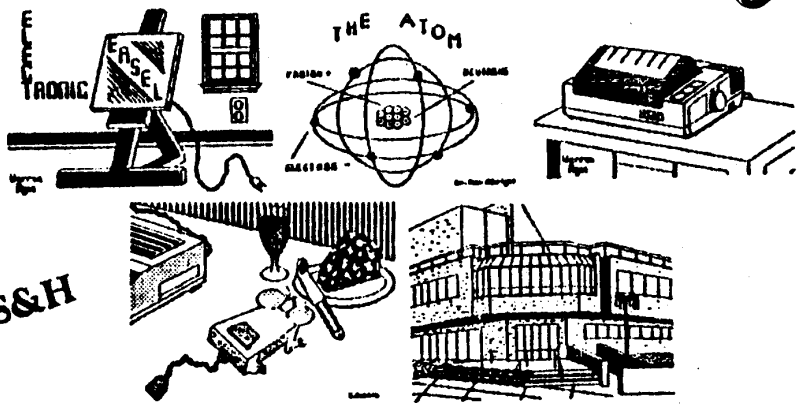
INCREDIBLE NEW FONTS

TINY LARGE WEIRD *SLANTED*

NEW

FOR ALL OCCASIONS

CLIPART AND PICTURES TOO!!



$47.95 +S&H

Tex-Comp has gone all the way to Australia to directly import the latest extended basic version of GraphX and has combined it in a user-friendly package with 2 **outstanding** companion disks from Asgard, which are filled with 24 sets of fancy typestyles (fonts) and a huge collection of clip art pictures which can be printed out to make labels, illustrations, letterheads, etc. The companion disks contain a total of 14 clip art files with each file containing an assortment of different pictures.

By using GraphX together with these 2 companion disks, you'll have the ability, not only to create your own graphics, but also an **outstanding collection of ready-to-use illustrations & typestyles.** Requires 32K, disk drive, joystick and Epson or Star compatible printer.

VISA MASTERCARD

add 3% for credit card orders

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24 Hour Order Line

SEND ORDER AND MAKE CHECKS PAYABLE TO

TEX COMP™

Texas Instruments AUTHORIZED DEALER

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling ($3.00 minimum). Cost of Mississippi 4½%. Free shipping on all hardware orders over $100.00. Prices and availability subject to change without notice. We reserve the right to limit quantities.

NOTE: Payment in full must accompany all orders. Credit Card, Company Check or Money Order for immediate shipment. Personal checks require up to 4 weeks to clear. California orders add 6½% sales tax.

"The Leader of the Pack"

SEND $2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A $5.00 SAVINGS CERTIFICATE.

The sysops of CompuServe's TI Forum

Jonathan Zittrain, of Pittsburgh, Pennsylvania, became an official TI Forum sysop in September 1984.

Zittrain celebrated his sixteenth birthday on Christmas Eve, 1985. He is in the eleventh grade at the Shadyside Academy.

He says he first got a TI in the summer of 1982 but that he got interested in computing when he was "really young" and his brother was involved with the data center at his high school.

He subscribed to CompuServe in January 1983 and says he learned a lot from the Computer and Electronics Magazine SIG (special interest group) before the TI Forum began in February 1984.

Zittrain, who is vice president of the Pittsburgh Users Group, says he is good at Extended BASIC and "trying to learn assembly" and says that in addition to helping Forum users with BASIC and XBASIC, he assists them with using CompuServe and shows them "how to get things running and how to get things started."

He is also involved in maintaining the Forum's Data Libraries.

Zittrain rates as his best accomplishment so far the establishment of the TI News area on the Forum, which contains help and tutorials and has former data library text in formattable form.

He is working also on new Forum software, he says.

"I'm amazed by the number of friends I've made, the people I've met," he says. "Instead of just being just someone in Pittsburgh, I'm on a national network."

Access CompuServe
At the prompt type
GO TEX 200

HELP—

(Continued from Page 16)

```
 PROMPT 'DSK1.' WILL"
380 PRINT "APPEAR, WITH THE
CURSOR      FLASHING AFTER IT
. JUST TYPETHE NAME OF A SON
G, AND THEN<ENTER>. IT WILL
RUN AND ANDPLAY. IF YOU ENTE
R AN INCOR-"
390 PRINT "RECT SONG YOU WIL
L GET THE  MESSAGE 'DEVICE C
AN NOT BE  ACCESSED' AND THE
N YOU CAN  TRY AGAIN. TO PLA
Y THE SAME"
400 PRINT "SONG AGAIN, SELEC
T '1' FOR  AGAIN, IT WILL TH
EN PLAY    ANOTHER TIME."
410 GOSUB 1040
420 CALL CLEAR :: PRINT "INS
TRUCTIONS FOR:": :"COMPOSING
": : : : : : : : : : :
430 GOSUB 1040
440 CALL CLEAR :: PRINT "TO
COMPOSE A SONG YOU MUST  KNO
W THE TOTAL NUMBER OF    NOT
ES. THIS NUMBER WILL BE  FOR
 A TRIO OF NOTES. ENTER"
450 PRINT "THIS NUMBER AS TH
E FIRST    DATA IN YOUR LIST
. THEN     LIST A TIME IN MI
LISECONDS  AND YOUR THREE NO
TES. THEN  REPEAT-TIME/THREE
 NOTES ETC."
460 PRINT "UNTILL YOU HAVE E
NTERED ALL NOTES. THESE DATA
 STATEMENT ARE ENTERED IN TH
E PROGRAM  'MAKE', WHICH CAN
 BE RUN    FROM THE MAIN PRO
GRAM, THE"
470 PRINT "START OF THIS PRO
GRAM OR    BY RUNNING 'DSK1.
MAKE' FROM A COLD START."
480 GOSUB 1040
490 CALL CLEAR :: PRINT "TO
ENTER A NOTE YOU WILL    GIV
E IT'S POSITION ON THE   GRA
ND STAFF. THE LOWEST NOTETHA
T THE TI-99/4A CAN MAKE  IS
110 HERTZ. THIS IS C AND"
500 PRINT "IS GIVEN THE NUMB
ER '1'. THENEXT NOTE (C SHAR
P) IS '2', WITH D BEING '3'.
 D SHARP/E FLAT IS '4'. THIS
 IS        CONTINUED FOR A T
OTAL OF 45"
510 PRINT "HALF STEPS. UP TO
 THE G     SHARP ABOVE THE T
REBBLE     STAFF."
520 GOSUB 1040
530 CALL CLEAR :: PRINT "HER
E IS A PICTURE OF THE LO-CAT
IONS OF THE NOTES.": : : : :
 : : : : : : :: GOSUB 1040
540 PRINT "--------30------
   -44-"
550 PRINT "       29
  42"
560 PRINT "--------27------
   -41-"
570 PRINT "       25
  39"
580 PRINT "--------24------
   -37-"
590 PRINT "       22
  36"
600 PRINT "--------20------
   -34-"
610 PRINT "       18
  32"
620 PRINT "--------17------
 ---30-----"
630 PRINT "       15
NOTE:^THE"
640 PRINT "        -13-
ABOVE IS"
650 PRINT "       12
LOCATED"
660 PRINT "--------10------
ABOVE THE"
670 PRINT "        8
GRAND"
680 PRINT "---------6------
STAFF."
690 PRINT "        5"
700 PRINT "---------3------"
710 PRINT "        1"
720 PRINT "----------------"
730 PRINT
740 PRINT "----------------"
750 GOSUB 1040
760 CALL CLEAR :: PRINT "THA
T SHOWED THE STAFF WITH  NO
SHARPS OR FLATS. TO ENTERA S
HARP GIVE THE NEXT HIGER NUM
BER, EX. F=6/F#=7. A FLATUSE
S THE NEXT LOWER NUMBER,"
770 PRINT "EX. B=12/B FLAT=1
1. TO PLAY A REST ENTER THE
NUMBER 46. THIS HAS BEEN ASS
IGNED A    FREQUENCY OF 4400
```

(Please turn to Page 20)

Texas Instruments TI 99/4A – COMPUTERS COMPONENTS AND SOFTWARE

TEX-COMP

America's Number One TI computer retailer

Presents

Super Savings

On Essential Software Packages for the Texas Instruments Home Computer

As part of its program of long-term support for the TI-99/4A user, Tex-Comp has purchased truck-load quantities of original TI Software that is essential to the serious & dedicated user.

In turn, Tex-Comp is passing the savings on to **YOU!**

All TI Software in this advertisement is brand new, original TI Product in factory-sealed packages and is sold with a full Texas Instruments warranty, which TI has publicly committed to.

Now is the time to buy **Key Software** at a fraction of its original cost.

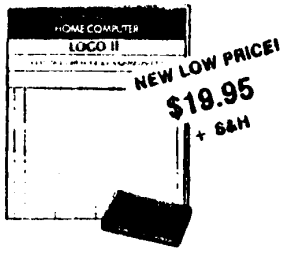
There may never be a better time than now to buy

TI Multi-Plan

Electronic Worksheet with many advanced features and built-in ease of use. Requires disk drive and controller, and 32K memory Expansion Unit. Printer and RS-232 Interface recommended. Cartridge and Disk.

TI Writer

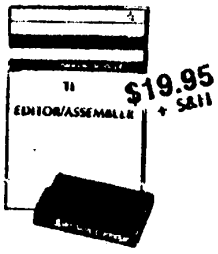
This is a professional word processing system for the TI-99/4A. Provides the features and ease of use found in office systems. Requires disk drive. 32K Memory and Printer. Module and Disk.



Logo II

In use by educators throughout the country. Requires cassette or disk based system and 32K memory expansion.

SPECIAL!! Multi-Plan & TI Writer $69.95 + S&H All 3 of the above programs $84.95 + S&H



Editor/Assembler

This is the complete version with manual, module, program disk and the disk version of Tombstone City as an example of assembly language programming. 32k and disk drive are required. This package will allow you to program the 99/4A in TMS 9900 Assembly Language and gives you access to all system features. Provides the fastest speed possible from the 16-bit processor!

Special Bonus with Editor/Assembler Purchase

Order with "Introduction to Assembly Language for the TI Home Computer" by Ralph Molesworth for only $4.95 + S&H (a $9 savings)

Get the Widgit (Navarone's Cartridge Expander Board) and the Editor/Assembler for only $38.95 (a $5 savings)

Order all 3 Editor/Assembler, Molesworth's book and the Widget for only $43.95 + S&H (Save $14)

Original TI-Extended Basic Still the BEST for Less!

A powerful, high-level programming language that expands the capability of your TI-99/4A Home Computer. Includes TI Extended BASIC module (36K bytes of preprogrammed memory) and Owner's reference manual.

Mini-Memory

This software cartridge adds memory to your system. Totals 14K of memory (6K of GROM, 4K of ROM, 4K of RAM). Mini Memory includes a built-in battery, permitting programs and data stored in RAM to be retained even if module is removed from console.

BONUS: FREE Mini-Writer I word processor (a $19.95 value) with Mini-Memory Purchase.

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TEX-COMP

Texas Instruments AUTHORIZED DEALER

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Add 3% shipping and handling ($3.00 minimum). East of Mississippi 4½% (Free shipping on all software orders over $100.00). Prices and availability subject to change without notice. We reserve the right to limit quantities.

NOTE: Payment in full must accompany all orders. Credit Card, Company Check or Money Order for immediate shipment. Personal checks require up to 4 weeks to clear. California orders add 8½% sales tax.

"The Leader of the Pack"

SEND $2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A $5.00 SAVINGS CERTIFICATE.

DISK + AID

This is the most advanced, user friendly disk repair utility you can own. This incredible program, as reviewed in April MICROpendium, "...IS IN A CLASS BY ITSELF." With over 30 single keystroke operations teamed together with a manual, which is an entire tutorial on the TI disk operatingsystem, you have a package that has yet to be matched by any program available. Sector zero and directory sector mapping is the most advanced of any program available today. The screen format is considered by many to be the best ever designed. Hard copy formatting is unmatched by any program. DISK + AID is an invaluable addition to your utility software collection and is the best you can own for file and data recovery. XB, MM, EA, 32K, DISK REQUIRED. $20.00

GRAPHX

Believed by many to be the most advanced graphics program ever written for the TI-99/4A home computer. GRAPHX has features not found on any other graphics program available for the TI. Many of its features can only be found in professional graphics systems. Animation, full color, sophisticated circle drawing, 4 printout formats, plus much more can now be at your fingertips. Please specify XB, EA or MM when ordering GRAPHX. XB, MM, EA, 32K, DISK, JOYSTICK $37.50

TURBO DATAMAN

This true database is by far the fastest and most powerful database today. You can link screens together for complex applications or build a simple address file. You can use it to keep accounting books for a home or business. Powerful math computational capabilities on your data as you enter it is a feature unmatched by any database program. With this feature, you can have spreadsheet capabilities in your databases. Full field editing is available to keep your information perfect as you enter it. Customize your data entry screens using a combination of graphics and text. Forms report generator for your custom reports. Written in XB and assembly for incredible speed. Up to 30 fields per record and 256 characters per record. XB, 32K, DISK $30.00

XB DETECTIVE

This incredible XB programming utility is a one of a kind and a first for the TI-99/4A. Offering editing features never known to the XB programmer. List to screen or printer, in alphabetical order, all the variables in your program and find out what line numbers they're in. Find variables that keep giving you program errors like "IMPROPERLY USED NAME." Find reserved words for easier debugging. Delete one line or a group of lines without having to continually press enter or list them. Find "GOTO'S", "GOSUB'S" and "SUB'S" to track program flow. Find where a file is opened, closed or deleted. Written entirely in assembly language, XB, 32K DISK $18.00

Please include $1.50 S&H for each program ordered. Michigan residents add 4% sales tax. Personal checks, money orders or C.O.D. Dealer inquiries invited. Free catalog available.

THOMSON SOFTWARE DAY PHONE 616-755-2943
1461 BEACH STREET
MUSKEGON, MI 49441-1099 AFTER 4PM 616-726-4602

HELP—

(Continued from Page 18)

```
0 HERTZ.   THE DURATION OF T
HE NOTE IS"
780 PRINT "ENTERED IN MILISE
CONDS. ANY VALID TIME MAY BE
 USED. I   HAVE FOUND THAT A
 TIME OF   LESS THEN 300 GIV
E A CHOPPY SOUND.": : : : :
790 GOSUB 1040
800 CALL CLEAR :: PRINT "INS
TRUCTIONS FOR USING THE": :"
'MAKE' FILE.": : : : : : : :
 : : :
810 GOSUB 1040
820 CALL CLEAR :: PRINT "WHE
N THIS OPTION IS SELECTEDTHE
 FILE 'DSK1.MAKE' WILL   RUN
. YOU WILL SEE THE PROMT:RUN
/TEST/BREAK/SAVE": :
830 PRINT "TO SELECT ANY OF
THESE JUST PRESS R,T,B,S. WH
EN WRITING A SONG SELECT BRE
AK. THIS   WILL BREAK THE PR
OGRAM AND  TELL YOU WHAT LIN
E TO START"
840 PRINT "ENTERING YOU DATA
. AFTER THEDATA IS ENTERED '
RUN' THE   PROGRAM. WHEN THE
 PROMPT    LINE APPEARS PRES
S 'T' FOR  TEST. THIS WILL R
EAD YOUR"
850 PRINT "DATA AND PRINT IT
 TO THE    SCREEN.": : : : :
 :: GOSUB 1040
860 PRINT "YOU WILL THEN BE
ABLE TO SEEIF YOU HAVE ENTER
ED THREE   NOTES FOR EACH TI
ME. IT WILLALSO TELL IF YOU
HAVE"
870 PRINT "ENTERED TOO HIGH
OF A NUMBERFOR THE TOTAL NUM
BER OF     NOTES. TO STOP TH
E LISTING  HOLD ANY KEY. TO
RESTART    RELEASE THAT KEY.
"
880 PRINT : : : :
890 GOSUB 1040
900 CALL CLEAR :: PRINT "AFT
ER THE DATA FILE HAS BEENTES
TED SELECT 'S' FOR SAVE. THE
 PROGRAM WILL END AND    PRO
MT YOU TO SAVE THE FILE  AS
'DSK1.WORK'. IF IT IS"
910 PRINT "SAVED IN THIS WAY
```

(Please turn to Page 22)

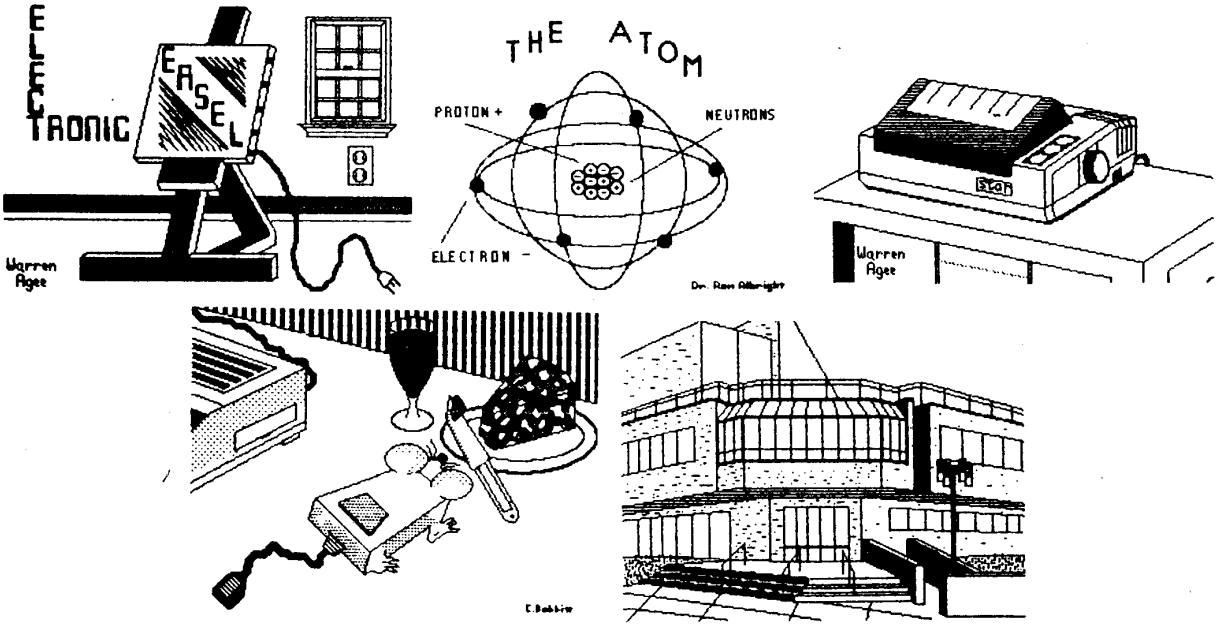
$7.00 GRAPHX COMPANION II

INCREDIBLE NEW FONTS

TINY LARGE WEIRD *SLANTED*

FOR ALL OCCASIONS

CLIPART AND PICTURES TOO!!



An all new set of art work from the people that brought you GRAPHX COMPANION (see review in Sept. '85 *MICROpendium*). Requires the GRAPHX drawing system.

Asgard Software
POB 10306, Rockville MD 20850

HELP—

(Continued from Page 20)

```
 IT CAN BE 'RUN' FROM THE MA
IN PROGRAM OR FROM THE START
 OF THIS   PROGRAM. THE DATA
 STATEMENT WILL BE INTACT AN
D YOU CAN"
920 PRINT "ADD TO OR CHANGE
THEM. THE  FILE 'DSK1.MAKE'
WILL STILL BE AVAILABE TO CR
EAT A DIF- FERENT SONG. PLEA
SE NOTE    ONLY ONE 'WORK' F
ILE CAN BE"
930 PRINT "RUN FROM THIS SYS
TEM. IF YOUWANT TO HAVE MORE
 THAN ONE  SONG UNDER WAY YO
U CAN SAVE THEM WITH OTHER N
AMES. YOU  WILL THEN NEED TO
 RUN THAT"
940 PRINT "FILE FROM A COLD
START." :: GOSUB 1040
950 CALL CLEAR :: PRINT "AFT
ER YOU HAVE 'TESTED' AND SAV
ED YOU DATA, SELECT 'R'  FOR
 RUN. YOU WILL THEN BE   PRO
MPTED FOR A NAME TO SAVE YOU
R FINISHED SONG. THE MAIN"
960 PRINT "PROGRAM 'PIANO' W
ILL THEN   RUN, AND YOU CAN
PLAY YOUR  NEW COMPOSITION."
: : : : : : : : : :
970 GOSUB 1040
980 CALL CLEAR :: PRINT "INS
TRUCTIONS FOR:": : :"'INDEX'
": : : : : : : : : : : :: GOSU
B 1040
990 CALL CLEAR :: PRINT "TO
SEE ALL OF THE SONGS THATYOU
 HAVE SAVED SELECT '4'   FOR
 INDEX. EVERY SONG THAT  YOU
 HAVE SAVED WITH THE     'MA
KE' PROGRAM WILL THEN BE"
1000 PRINT "LISTED. PRESS <E
NTER> TO    STEP THROUGH ALL
 OF THE     TITLES. AT ANY T
IME YOU CAN PRESS 'Q' TO QUI
T, AND"
1010 PRINT "RETURN TO THE ME
NU:":"AGAIN>1 NEW>2 END/COMP
OSE>3 INDEX>4": : : : : : : :
: :: GOSUB 1040
1020 CALL CLEAR :: PRINT "TH
ESE INSTRUCTIONS CAN BE   RU
N FROM THE MAIN PROGRAM BYSE
LECTING '3', THEN         SE
LECTING THE 'HELP' OPTION.":
 : : : : : :: GOSUB 1040
1030 RUN "DSK1.PIANO"
1040 PRINT :"<PRESS ANY KEY>
" :: CALL SOUND(200,999,0)
1050 CALL KEY(0,K,S):: IF S=
0 THEN 1050
1060 CALL CLEAR :: RETURN
```


SPACESTATION PHETA
VERSION 2.0

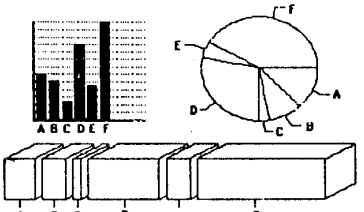
Explore the mysterious abandoned spacestation before your oxygen supply depletes.

Features • Graphics & Sound • Sprites for better animation • 79 built-in game screens • Editor allowing you to make your own screens • Built in solutions to all 79 screens, plus solution editor for your screens • High score feature • Joystick or keyboard game control • Game speed control • More!

Written in Wycove Forth, Spacestation Pheta is definitely one of the most sophisticated games available for the TI-99/4A Computer. The game occupies over 27K bytes of RAM, but loads in less than 25 seconds. The 79 screens are efficiently stored on disk. System requirements include 32K Memory Expansion, disk drive, and one of the modules Extended BASIC, Editor/Assembler, Mini Memory, or TI-Writer.

Obtain a copy from your local dealer or send $14.95 to T&T Software, 109 Tee Circle, Salem, VA 24153.

EXTENDED BUSINESS
GRAPHS!



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LOAD

```
100 RUN "DSK1.HELP"
```

PIANO

```
80 REM ***PIANO***
90 CALL INIT :: CALL LOAD(-3
1878,3)
100 DIM R(46),C(46),R2(46),C
2(46),R3(46),C3(46),N(46),N1
(400),N2(400),N3(400),T(400)
110 MS$="

          " :: F$="*"
120 CALL CLEAR :: CALL COLOR
(9,2,15,10,16,15,11,13,2,12,
3,1,13,16,3,14,12,1):: FOR L
=2 TO 8 :: CALL COLOR(L,16,1
):: NEXT L
130 BR$="0000000303030303" :
: BC$="000000C3C3C3C3C3" ::
BL$="000000C0C0C0C0C0" :: DO
$="000000FFFFFFFFFF" :: W$="
7F7F7F7F7F7F7F7F"
140 CALL CHAR(112,"FFFFFFFFF
FFFFFF",120,"FFFFFFFFFFFFFF
FF",121,"0103070F1F3F7FFF",1
22,"80C0E0F0F8FCFEFF")
150 CALL CHAR(100,"0",128,"1
0101030FF",129,"101010101010
1010",136,"0000000000103810"
,126,"00000000000103810")
160 CALL CHAR(113,"FFE7E7E7E
7CF9FFF",114,"FFE7E7E7E7F3F9
FF"):: CALL SCREEN(5)
170 CALL CHAR(97,BR$,98,BC$,
99,BL$,104,W$,40,DO$)
180 PRINT "          ";CHR$(13
6);"          ";CHR$(136);"
 yxxxxx";CHR$(129);"xxxxxxxx
xx";CHR$(129);"xxxxxz"
190 PRINT " yxxxxxx";CHR$(12
8);"xxxxxxxxxx";CHR$(128);"x
xxxxxz":" ppppppppppppppppp
ppppppp":" pppppppppppppppp
ppppppppp"
200 PRINT "yxxxxxxxxxxxxxxxx
xxxxxxxxxxz":"ddddddddddddd
ddddddddddddd":"dabcabbcabc
abbcabcabbcabcabd":"dhhhhhhh
```

(Please turn to Page 24)

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PIANO—

(Continued from Page 22)

```
hhhhhhhhhhhhhhhhhhhd"
210 PRINT "ddddddddddddddddd
ddddddddddd" :: FOR L=1 TO 8
 :: PRINT " ppppppppppppppp
pppppppppp" :: NEXT L :: PRI
NT " pppppppppppqrppppppppp
ppp"
220 PRINT :"PLEASE WAIT, I A
M STUDYING  MY MUSIC.":
230 FOR P=1 TO 46 :: READ R(
P),C(P):: NEXT P :: RESTORE
260
240 FOR P2=1 TO 46 :: READ R
2(P2),C2(P2):: NEXT P2 :: RE
STORE 260
250 FOR P3=1 TO 46 :: READ R
3(P3),C3(P3):: NEXT P3 :: RE
STORE 260
260 DATA 70,26,64,29,70,34,6
4,37,70,42,70,50,64,53,70,58
,64,61,70,66,64,69,70,74270
DATA 70,82,64,85,70,90,64,93
,70,98,70,106,64,109,70,114,
64,117,70,122,64,125,70,130
280 DATA 70,138,64,141,70,14
6,64,149,70,154,70,162,64,16
5,70,170,64,173,70,178,64,18
1,70,186
290 DATA 70,194,64,197,70,20
2,64,205,70,210,70,218,64,22
1,70,226,64,229,54,17
300 FOR L=1 TO 45 :: N(L)=IN
T(104*(2^(L/12))):: NEXT L :
: N(46)=44000
310 GOTO 410
320 DISPLAY AT(22,1):MS$
330 DISPLAY AT(22,1):"PLAYIN
G:" :: DISPLAY AT(23,5):NAME
$
340 FOR LO=1 TO TN
360 CALL SOUND(T(LO),N(N1(LO
)),0,N(N2(LO)),0,N(N3(LO)),0
)
370 CALL SPRITE(#1,40,15,R(N
1(LO)),C(N1(LO)),#2,40,15,R(
N2(LO)),C(N2(LO)),#3,40,15,R
(N3(LO)),C(N3(LO)))
380 NEXT LO
390 CALL SOUND(1,44000,30)::
 CALL DELSPRITE(ALL)
400 FOR DEL=1 TO 300 :: NEXT
 DEL
410 DISPLAY AT(22,1):"AGAIN>
1 NEW>2 END/COMPOSE>3 INDEX>
4                          "
420 CALL KEY(0,K,S):: IF S=0
 THEN 420
430 K=K-48 :: IF K<1 OR K>4
THEN 420
440 ON K GOTO 320,450,520,64
0
450 DISPLAY AT(22,1):MS$ ::
DISPLAY AT(22,1):"DEVICE NAM
E>DSK1."
460 ACCEPT AT(22,18)SIZE(9)B
EEP:NAME$ :: NAM$=F$&NAME$
470 ON ERROR 620
480 OPEN #1:"DSK1."&NAM$,INP
UT ,INTERNAL,FIXED 40
490 INPUT #1:TN
500 FOR L=1 TO TN :: INPUT #
1:T(L),N1(L),N2(L),N3(L):: N
EXT L
510 CLOSE #1 :: GOTO 320
520 CALL CLEAR :: CALL CHARS
ET :: CALL SCREEN(8):: PRINT
 "1. TO CREATE A NEW SONG.
  2. TO ADD TO 'WORK' FILE.
  3. RETURN TO MAIN PROGRAM.
"
530 PRINT "4. HELP (INSTRUCT
IONS)       5. QUIT"
540 CALL KEY(0,K,S):: IF S=0
 THEN 540
550 IF K=49 THEN RUN "DSK1.M
AKE"
560 IF K=50 THEN RUN "DSK1.W
ORK"
570 IF K=51 THEN 110
580 IF K=52 THEN RUN "DSK1.H
ELP"
590 IF K=53 THEN END
600 GOTO 520
610 DISPLAY AT(22,1):MS$ ::
GOTO 410
620 DISPLAY AT(22,1):"DEVICE
 CAN NOT BE ACCESED" :: CALL
 SOUND(500,999,0):: FOR DEL=
1 TO 1500 :: NEXT DEL
630 DISPLAY AT(22,1):MS$ ::
GOTO 410
640 DISPLAY AT(22,1):MS$ ::
DISPLAY AT(22,1):"ENTER FOR
NEXT/ Q TO QUIT"
650 OPEN #1:"DSK1.",INPUT ,R
ELATIVE,INTERNAL
660 INPUT #1:AA$,BB,CC,DD
670 IF LEN(AA$)=0 THEN 750
680 CALL KEY(0,K,S):: IF K=8
1 THEN 750
690 FF$=SEG$(AA$,1,1):: IF F
F$<>"*" THEN 660
700 D$=SEG$(AA$,2,LEN(AA$)):
: DISPLAY AT(23,1):D$
710 CALL KEY(0,K,S)!:: IF S=
0 THEN 1030
720 IF K=13 THEN 660
730 IF K=81 THEN 750
740 GOTO 710
750 CLOSE #1
760 GOTO 410
```

STAFF

```
90 REM ***STAFF***
100 CALL CLEAR
110 PRINT "PRINTING NUMBERS"
: : : : : : :
120 OPEN #1:"PIO"
130 PRINT #1:"
 -44-"
140 PRINT #1:"
42"
150 PRINT #1:"
 -41-"
160 PRINT #1:"
39"
170 PRINT #1:"
 -37-"
180 PRINT #1:"
36"
190 PRINT #1:"
 -34-"
200 PRINT #1:"
32"
210 PRINT #1:"----------
--30----------"
220 PRINT #1:"
29"
230 PRINT #1:"----------
--27----------"
240 PRINT #1:"
25"
250 PRINT #1:"----------
--24----------"
260 PRINT #1:"
22"
270 PRINT #1:"----------
--20----------"
280 PRINT #1:"
18"
```

(Please turn to Page 26)

TI-99/4A ACCESSORIES FROM TEX-COMP

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SEND $2.00 FOR NEW 1986 CATALOG WHICH INCLUDES A $5.00 SAVINGS CERTIFICATE.

STAFF—

(Continued from Page 24)

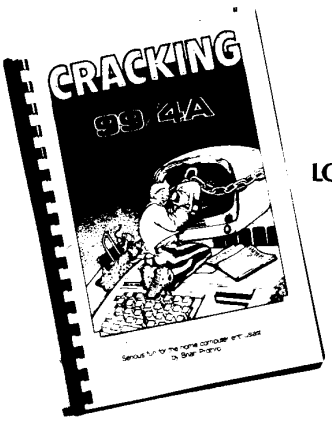
```
290 PRINT #1:"--------------
--17----------"
300 PRINT #1:"
15"
310 PRINT #1:"
 -13-"
320 PRINT #1:"
12"
330 PRINT #1:"--------------
--10----------"
340 PRINT #1:"
 8"
350 PRINT #1:"--------------
--6-----------"
360 PRINT #1:"
 5"
370 PRINT #1:"--------------
--3-----------"
380 PRINT #1:"
 1"
390 PRINT #1:"--------------
--------------"
400 PRINT #1:" "
410 PRINT #1:"--------------
--------------"
420 CLOSE #1
430 RUN "DSK1.HELP"
```

WORK

```
80 REM *WORK & MAKE***
90 REM THE 'MAKE' AND 'WORK'
PROGRAMS ARE IDENTICAL BUT MU
ST BE SAVED SEPARATELY
100 IMAGE #### #### #### ###
# ####
110 CALL CLEAR :: F$="*"
120 PRINT "RUN/TEST/BRAKE/SA
VE FILE"
130 CALL KEY(0,K,S):: IF S=0
 THEN 130
140 IF K=66 OR K=98 THEN CAL
L CLEAR :: PRINT "START THE
DATA STATEMENTS INLINE 490.
PUT THE TOTAL NUM-BER OF NOT
ES IN THE FIRST  DATA STATE
MENT." :: END
150 IF K=84 OR K=116 THEN 35
0
160 IF K=82 OR K=114 THEN 20
0
170 IF K=83 OR K=115 THEN 45
0
180 GOTO 120
190 DIM T(400),N1(400),N2(40
0),N3(400)
200 CALL CLEAR :: DISPLAY AT
(20,1):"HAVE YOU SAVED THIS
FILE?  (Y/N)" :: CALL SOUND
(200,999,0)
210 CALL KEY(0,K,S):: IF S=0
 THEN 210
220 IF K=89 THEN 250
230 IF K=78 THEN 110
240 GOTO 210
250 CALL CLEAR :: DISPLAY AT
(20,1):"SAVE THIS SONG AS?"
260 DISPLAY AT(21,1):"DSK1."
```

(Please turn to Page 28)

YOU MISSED SOMETHING!



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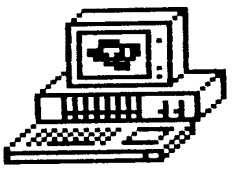
GRAPHX

drawn with GRAPHX



As its makers call it, this is the "ultimate graphics software", but you don't have to take their word for it, see what MICROpendium said in their June 1985 review of GRAPHX: "this program is a first class drawing program, almost as versatile and nearly as sophisticated as the $1000 Auto/CAD for the TI-Pro". MICROpendium gave it straight A's. HOME COMPUTER MAGAZINE wrote in their Vol 5 No 5 issue: "It is a program that once again will fill you with the excitement of owning a home computer... GRAPHX is amazingly easy to use for a program that offers so many features.... With it's low cost and numerous features, GRAPHX deserves serious consideration" The program sells for $39.95 plus $1.50 S&H, Check, M.O., C.O.D.
Req: 32K, joystick, disk and either EX-BASIC, Mini Memory or Ed-Assembler.

TI 1-2-3

This is the classic integrated software package containing a full feature word processor, a spreadsheet, and a typewriter all on the same disk or cassette. Features: full screen text editor, right margin justification, capability of linking many files, built in disk manager and calculator window, spreadsheet value as large as 100,000,000, number crunching, manual in hard cover binder, assembly language support Available on disk or cassette for 32K with X-Basic. $34.95, +$2.5 SH Check, M.O., C.O.D.

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SXB

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Req:32K,disk,X-BASIC

SEND ORDER TO:

DATAX CO. 1923 LINDEN STREET,
RIDGEWOOD, NY 11385 (718)417-0165

WORK—

(Continued from Page 26)

```
 :: ACCEPT AT(21,6)SIZE(9)BE
EP:NAME$
270 NA$=F$&NAME$
280 READ TN
290 FOR L=1 TO TN :: READ T(
L),N1(L),N2(L),N3(L):: NEXT
L
300 OPEN #1:"DSK1."&NA$,OUTP
UT,INTERNAL,FIXED 40
310 PRINT #1:TN
320 FOR L=1 TO TN :: PRINT #
1:T(L),N1(L),N2(L),N3(L):: N
EXT L
330 CLOSE #1
340 RUN "DSK1.PIANO"
350 ON ERROR 410
360 READ TN
370 FOR L=1 TO TN :: READ A,
B,C,D :: PRINT USING 100:L,A
,B,C,D
380 CALL KEY(0,K,S):: IF S=-
1 THEN 380 ELSE 390
390 NEXT L
400 RESTORE :: PRINT :: GOTO
 120
410 PRINT "YOU DO NOT HAVE E
NOUGH DATA STATEMENT FOR THE
 TOTAL NUM-BER OF NOTES IN L
INE 490.   THE TOTAL NUMBER
OF NOTES INLINE 490 IS";
420 PRINT TN:"YOU ONLY HAVE"
;L-1;"DATA STATEMENTS."
430 PRINT "CHECK THE DATA IN
 LINE 490."
440 RESTORE :: PRINT :: GOTO
 120
450 CALL CLEAR :: PRINT "IN
ORDER TO COME BACK TO    THI
S FILE, IT MUST BE SAVED AS
A SEPARATE PROGRAM."
460 PRINT "IF IT IS SAVED AS
 'WORK' IT CAN BE ACCESSED F
ROM THE    MAIN PROGRAM. IF
THIS FILE  IS READY TO STORE
, JUST"
470 PRINT "'RUN' THIS PROGRA
M. IF IT   HAS NOT BEEN 'SAV
ED' ALL    DATA STATEMENTS W
ILL BE     LOST.": :
480 PRINT "REMEMBER SAVE THI
S PROGRAM  AS 'DSK1.WORK'" :
: END
490 DATA
500 DATA
510 DATA
520 DATA
530 DATA
540 DATA
550 DATA
560 REM ADD MORE DATA
570 REM IF NEEDED
```

GROM chip list offer

Kent Sheets of the OH-MI-TI Users Group of Oregon, Ohio, says he has a list of available GROM chips and prices from TI. Also listed are prices and part numbers for cartridge cases, PCB boards and other parts.

Sheets says he will send a copy of the lists to persons requesting it for $1. Write him at 1673 N. Curtice Rd., Curtice, OH 43412.

TIRED OF TYPING THE SAME COMMAND OVER AND OVER?

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'Explorers' differ

Two similarly-named products for the TI, both from California, have different functions, according to their manufacturers.

They are Millers Graphics' Explorer program and The Explorer® by Tex-Comp.

Millers Graphics' Explorer, which sells for $24.95, is described in its manual as "designed to be used as a tool to help you understand how your computer thinks and operates and to be as transparent as possible to the environment or program that loaded it." According to the manufacturer, it allows the user to execute a variety of command modules, stopping and starting execution at any time with the press of the key. The user can watch the actual program screen in slower motion or watch the Explorer's main screen as it is update after each instruction, as well as stop the program and examine and modifying memory and other items (allowing "what if" experiments), according to the manufacturer.

The Explorer by Tex-Comp is a disk editor program which sells for $19.95. Jerry Price of Tex-Comp says that it "explores a disk sector by sector. It's analogous to the Disk Fixer by Navarone."

Price says Tex-Comp sells Navarone's Disk Fixer and would not ordinarily market a competing product to one it

(Please turn to Page 45)

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Tex-Comp has made a special purchase of genuine Texas Instruments diskettes that were used by TI forTI-99/4A disk software. All disks came with hub protectors and a Tyvek sleeve. Since they were used for software duplication they are 100% tested and certified. In fact, many may already be formatted and contain programs which can, of course, be written over.

While designated SS/DD, the ones we randomly tested are 100% error free when used as DS/DD.

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Changing colors helps clarity on monochrome monitor screen

By ROBERT L. WESSLER

Will the 99/4A work with a green or amber monochrome monitor?

Yes! But there are hurdles to overcome. After almost blinding myself looking at little black letters on a bright green screen, I set out to make my TI compatible with a monochrome monitor. These are a few of the things I was able to come up with.

When I purchased my 99/4A, I, like many TI users, connected it to a portable television. I was amazed at the quality of the display. Letters really looked like letters and the colors were beautiful. I was all set to compute.

Then my television broke down and I borrowed a friend's color monitor. When my television was fixed, I hooked it back up and was very disappointed. In comparison to the monitor I had been using, the letters which used to look like letters now looked like fuzzballs.

It was at this point I went in search of a monitor. When comparing color to monochrome, there was no comparison in the text on the screen. The text on a monochrome monitor is clear and precise. I purchased a nine-inch green screen monitor, took it home, and almost blinded myself.

I originally looked for a monochrome monitor with a switch to allow for inverse colors. After an extensive but fruitless search, I decided to make the software compatible to the monitor instead of making the monitor compatible with the software. It was very evident that white characters on a black background gave me the best quality for text. Colors on a green monitor are seen in different shades of green, with white being the brightest.

It was relatively simple to go into BASIC and Extended BASIC games and programs to change the colors. With a little experimentation I was able to give the graphics better contrast. Dark red, dark blue and dark green, for example, give off almost the same shade on a green monitor. By changing one or more of the colors to a lighter color, something that usually looks hideous in color, the contrasts can give you very sharp graphic images. Finding the hidden call screens and call colors proved challenging, but not difficult.

Not being an assembly language programmer, the colors on assembly language programs proved more difficult for me to change. I've ended up buying products which give me the option of changing the screen colors, such as PTERM, or I've asked the programmer to change the colors for me when I order the product, such as TE1200. (This discourages pirating the software, which is illegal anyway, because it's easy to trace the only program you sold with custom colors.)

Once the software library has been reprogrammed, the computer user will be able to use the monochrome monitor without further difficulty.

The computer programmer, on the other hand, still has the problem of the default colors built into the 99/4A. This can also be overcome. I found a very useful program in the November issue of SUBFILE 99. (SUBFILE 99, is an online magazine for the 99/4A on The Source Telecommunications network.) The program, when run, will reset the screen colors for programming. The program overrides everything. The program you are working on must be saved and the computer reset before your new program can be run and the colors tested. With permission, the program is reprinted below.

With a little work and a little patience, a monochrome monitor can be used with little difficulty, and much appreciation.

Good luck, and remember, it's all in the software.

In the following program, the screen color is set to white on black. The default colors may be changed by replacing the value "240" in line 330 with the decimal equivalent of the screen colors you wish to use. Using the formula: foreground × 16 + background. This will give you the decimal value of the screen colors you wish to have.

Having the screen colors you prefer can be helpful when you are keying in a program listing out of a book or magazine. Remember to save the program and reset the computer before running the program. The program requires Extended BASIC and a memory expansion.

```
100 !****************
110 !* SCREEN COLOR *
120 !*  SUBFILE 99  *
130 !*  THE SOURCE  *
140 !****************
150 !
160 CALL CLEAR :: CALL INIT
170 MEM=9459
180 FOR I=1 TO 50
190 READ X
200 CALL LOAD(MEM+I,X)
210 NEXT I
220 CALL LOAD(8194,37,38,"",
-31804,36,246)
230 CALL LOAD(9460,240)
240 END
250 DATA 244,0,2,1,0,135,208
,96,36,244,216
260 DATA 1,140,2,6,193,216,1
,140,2,2,1,0,72
270 DATA 216,1,140,2,6,193,2
16,1,140,2,2
280 DATA 0,0,32,216,32,36,24
4,140,0,6,0
290 DATA 22,251,4,91
```

This program was reprinted with thepermission of Michael Amundson, publisher of Subfile 99 on The Source.

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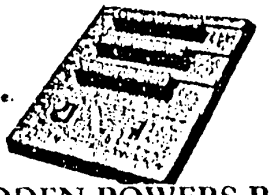

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IMPORTANT NOTE: Module programs will not run on 1981 V2.2 Consoles without Grom Buster. Check your title screen for compatibility.

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About those lithium batteries...

By RICHARD J. BAILEY

Judging from the letters...there seems to be a great deal of confusion and misunderstanding regarding lithium batteries. While I'm no battery expert, I would like to try to clear up some of the confusion with the information I've picked up over the years.

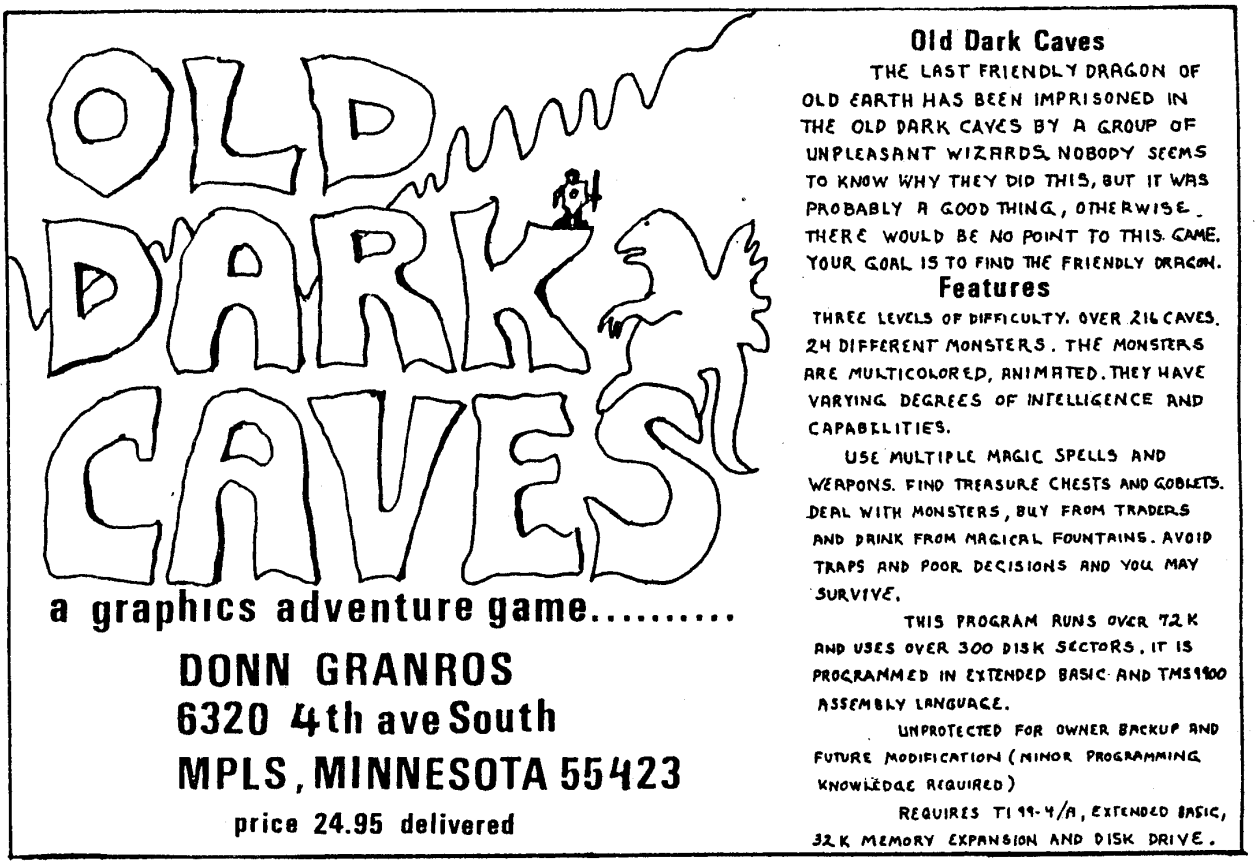
All batteries can be considered to be chemical systems consisting of electrodes of dissimilar materials with an electrolyte of carbon center electrode, a zinc case and a paste electrolyte of ammonium chloride. The characteristic voltage of a cell is determined by the cell chemistry and generally related to the elements used for the anode electrode. The electrolyte used in most cells is either a strong acid like sulfuric in a car battery or a strong base like potassium hydroxide in a nickel-cadmium (nicad) battery. In lithium batteries there is a wide range of materials used for the cathode electrode and a wide range of electrolytes used depending on the cell design. Some lithium cells have sulphur dioxide gas as the cathode material. Because the molecules in a gas are much further apart than in a liquid, these cells are not capable of current output in excess of a few milliamps (1000ths of an amp). To compensate for this some lithium cells designed for higher current output are pressurized to several atmospheres pressure to turn the gas to a liquid.

These cells have had FAA restrictions because they could explode if shipped in unpressurized cargo holds. Defective hermetic seals on these cells can cause what the manufacturers of these cells refer to as "rapid venting" but you might call an explosion.

Fortunately the cells used in digital watches and the Mini-Memory module are not highly pressurized. All lithium cells are hermetically sealed no matter what their internal pressure is because lithium is highly reactive and can burst into flame in air containing more than 2 percent moisture. Never open a lithium cell!

As a cell is discharged a chemical reaction takes place within the cell. The electrodes are the "fuel" for the reaction and the output is a current flow that operates a device such as a flashlight or the Mini-Memory module. When the "fuel" is depleted or the chemical equation that represents the reaction that takes place during discharge is satisfied, the battery is

(Please turn to Page 34)



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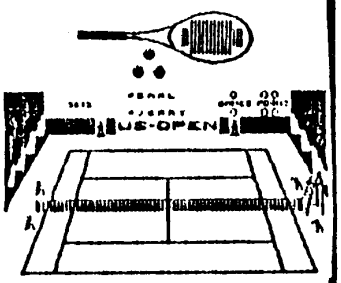

Championship Tennis lets you enjoy the excitement, action and thrills of a professional tennis match with complete control.

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LITHIUM BATTERIES—

(Continued from Page 32)

dead.

Depending on the cell chemistry, cells can have either a reversible or non-reversible chemical system. If the cell is non-reversible it is called a primary cell and must be replaced when discharged. Trying to charge a primary cell will not work and can cause cell heating, internal pressure and even "rapid venting."

All lithium cells currently (pun) produced are primary cells and must not be charged, of, for that matter, even discharged rapidly.

Secondary cells have a reversible chemical system and charging them generally restores them to their original state. Examples of secondary cells are lead-acid (car) batteries and nicad batteries. Depending on the cell chemistry the cell will require either a constant-current (for nicad) or a constant-voltage (for lead-acid) type charger. Charging either type by the opposite method can have disastrous results.

Charging a secondary cell generally results in a gaseous chemical byproduct. While chargers are sold for carbon flashlight batteries, these are not too effective. As these cells discharge a chemical reaction produces hydrogen gas bubbles around the carbon rod that is the center electrode. Charging these cells does not remove the gas bubbles and eventually the carbon electrode will be totally isolated from the electrolyte by the gas bubbles. In nicad cells the released gases recombine and the cell can be considered a closed (sealed) system. In a lead-acid battery the hydrogen gas produced can be ignited by a spark causing the battery to explode, spewing acid and shrapnel in all directions: ($2H + O \rightarrow H_2O$ plus energy).

The bottom line is: 1) never charge any lithium battery, or any other primary cell, *PERIOD!*; 2) never charge any nicad cell except in a charger specifically designed for that type and capacity cell. Nicads require constant-current type chargers; 3) never charge a lead-acid cell, including gelled-electrolyte type cells, in a nicad charger. These cells require a constant-voltage type charger. Only charge these cells in a well vented area.

The above explanation is somewhat generalized and oversimplified and does not deal with some of the other characteristics of different types of cells. Lithium cells have a shelf life of 5-10 years. Nicads can be recharged up to 1,000 times and perform almost as well as lithium in cold temperatures, making them ideal for use in flashlights if you're into winter mountain climbing like I am. Since none of the cells I've mentioned have a gauge to tell you when the cell is about to hit "empty," rechargeable cells are great for applications where you must know the amount of energy left in the cell. Nicads do not do well at higher temperatures around 100-125 degrees F. The self-discharge rate increases rapidly with temperature and cells might lose their charge in one week at these temperatures. Using nicads in the Mini-Memory or a flashlight in a hot clime would not be a good idea.

If nicads are allowed to go completely flat and stay in that condition for some time, the cells may develop internal shorts called "hairs" between the electrodes, rendering them useless unless you are familiar with the procedure of zapping shorts in nicads. It would also require three nicad cells wired in series (1.2 volts per cell) to replace one lithium cell (3 volts per cell) and where lithium watch cells are priced under $2 at Radio Shack there is no reason to resort to nicads as replacements in the Mini-Memory.

To find if your Mini-Memory battery needs to be replaced, measure the cell voltage with a high impedence voltmeter. If the cell voltage is much less than 3.0 volts, the cell needs to be replaced. If you want complete instructions on replacing your Mini-Memory battery with a lithium watch battery, see my article in the August 1985 New Hampshire User Group newsletter available through your user group if they exchange newsletters with us, or send a SASE (required!) to: New Hampshire 99'ers User Group, Inc., P.O. Box 5991, Manchester, NH 03108-5991

Foundation Computing out of business

Foundation Computing has gone out of business, and Kathy Hunter, vice president of marketing, described the firm as "financially bankrupt."

Foundation manufactured the Z80A card and 80-column card for the TI99/4A, as well as 32K and 128K memory cards for the machine.

Hunter described the firm's leaving business as resulting from a combination of events. The company which manufactured Foundation's boards went bankrupt "with the boards in tow," she said. She also noted that components supplied from a major company to Foundation "were faulty."

Hunter added that "John Koloen's articles were not very helpful."

Koloen, publisher of *MICROpendium,* wrote in the June 1985 issue that the Z80 card would not format a disk using the MRS operating system. In a subsequent issue he wrote that Foundation replaced his disk with one which worked properly.

Hunter said that sales of the Z80 card dropped by 75 percent following the initial article.

She said that the company will continue to offer maintenance and repairs for persons wishing support. For products under warranty, the customer will pay only the shipping and for products not under warranty, the customer will be charged $35 plus shipping.

New address for service is P.O. Box 455, Mill Valley CA 94942.

Copying utilities rates for speed

By JIM LEWIS

Recently I had a flash of initiative and decided to compare ALL the copy programs in my library. Following is the result of this effort. I hope this will help others to decide which one (or ones) to purchase. I didn't include timings from TI's Disk Manager II since everyone with a disk system probably has it already, and can run their own comparison. All of these programs require memory expansion.

These comparisons are based on a backup of SS/LIB/5, a full 360-sector SS/SD disk with 15 individual files.

Also, I am running the CorComp controller card set at 3ms. access time. This may make a difference in your actual times, but the comparisons should still be proportionately accurate.

PROGRAM	TIME

CorComp Disk Mgr 2.3 **1m/11s**

Loads fast, works fast (with Turbo option "ON"). Supports up to four DS/DD drives in any configuration. Copies individual files to the destination disk without over-writing what's already there. Won't overwrite sector 0 (but updates it when done). Displays sectors copied vs. sectors left. In individual mode, tells which file it's on and how many files/sectors are left to go. Won't copy proprietary, garbage sector 0 or dead sectored disks. Full on-screen prompts. Very friendly. (Requires CorComp disk controller.)

CorComp Inc., 1255 N. Tustin Ave., Anaheim, CA 92807, (714) 630-2903.

MassCopy Ver 3 **2m/25s**

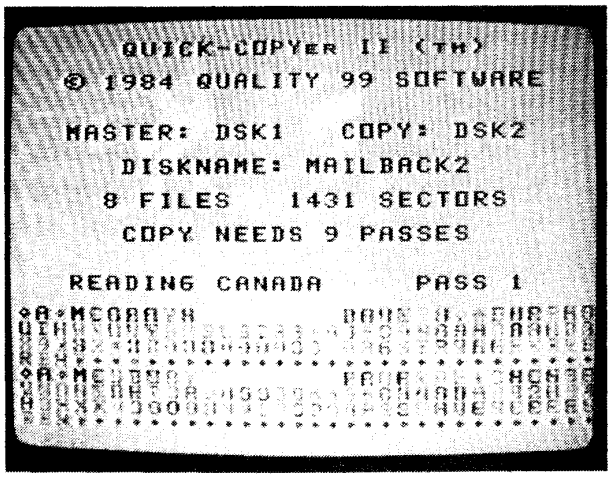
Medium load time. Runs from Editor/Assembler, Minimemory or Extended BASIC. Supports three drives in any configuration. Will make a backup to two 2 drives simultaneously. Will copy proprietary, dead-sectored, weird track-sectored disks. Will do simple initializing. Some flexibility of master and copy drives. Tells sectors copied vs. sectors left. Full on-disk instructions and on-screen prompts. This is a "freeware" type program, in that the author encourages you to pass it around. If you like it, he requests you send him $10. Not a bad deal!

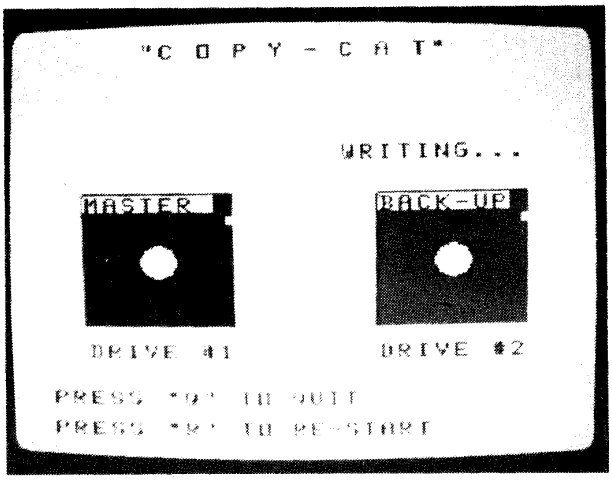
Steven Lawless, 2514 Maple Ave. Cedars, Wilmington, DE 19808.

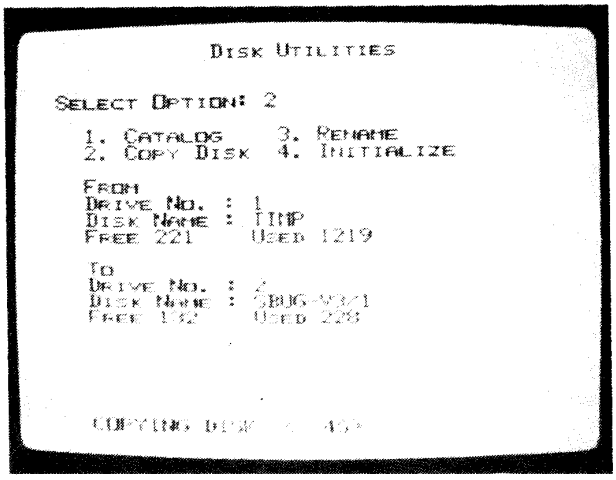
Floppy Copy **2m/27s**

Slow load time. Runs from Editor/Assembler, Mini-Memory or Extended BASIC. Supports four DS/DD drives in any configuration. Will copy to two drives simultaneously. Copies some proprietary and weird track-sectored disks. Allows sophisticated and fast initializing with selective tracks/sector. Full on-disk instructions and on-screen prompts. Displays passes and sectors to copy, which pass and

(Please turn to Page 36)







Above: screen from CorComp's Disk Manager program.

GRAM-KARTE, 80-column card planned

Products from Mechatronic GmBH of Germany are now available in the United States through Technical Application Product Engineering Ltd. of Ontario, California.

An 80-column card for the TI is scheduled for March release, according to Franz Wagenbach of T.A.P.E. He says that the German manufacturer says that the card is compatible with existing software and can switch from 80 to 40 columns.

The card is expected to be priced at approximately $200, Wagenbach says.

Mechatronic GmBH's Extended BASIC II + at $79.95 is now available, according to Wagenbach. The program, reviewed in the October MICROpendium, allows the user to produce high resolution graphics in XBASIC by using the 60 additional commands built into the XBII + cartridge.

A 128K memory expansion is available as a plug-in module with built-in centronics portand print spooling functions for $149.95. An internal RAM card version is scheduled for January release at $159.95.

Also scheduled for January release is the GRAM-KARTE by Heiner Martin, author of *TI Intern*.

GRAM-KARTE, priced at $249.50, is said to allow the user to transfer the contents of any cartridge to disk and to reload onto the card the contents of up to six cartridges, which are then menu-accessed. Up to three GRAM-KARTES can be loaded into the PEB.

GRAM-KARTE has 128K bytes of RAM of which 64K can be used as GRAM, according to Wagenbach. He says the remaining 64K are normal RAM and can be switched 16 ways by means of bank switching. The RAM can also be used for additional GRAM by special manipulation.

After the module is loaded into the GRAM-KARTE, the program can be modified and then saved to disk. GRAM-KARTE is said to be fully compatible with TI and CorComp controllers. Wagenbach says it has not yet been tested on the Myarc controller.

An English version of *TI 99/4A Intern: The Operating system of the TI-99/4A ROM and GROM Listing with Commentary and Directions for GPL*, by Heiner Martin, is available from T.A.P.E. for $17.95.

Also promised for January are a mouse which Wagenbach says provides PC-like screen icon graphics, priced at $98, and an EPROMmer at $129.50.

Scheduled for release in March is the QUICK DISK drive for 2.8-inch minidisks. Wagenbach says it is a self-contained disk drive and controller which does not need an expansion box, and will work with the CC40 as well as with the TI99/4A. Price is $199.95.

The company is also offering fig-Forth in cartridge form for $49.95. Orders are being taken now for probable April delivery, Wagenbach says.

For further information or to order, contact T.A.P.E. Ltd., P.O. Box 4042, Ontario CA 91761 or phone (714) 989-9906.

DISK COPYING PROGRAMS—

(Continued from Page 35)

which sectors have been copied and how many of each are left. Allows selective ending sector for weird disks.

The Softspot, P.O. Box 8786, Silver Spring, MD 20907.

Quick Copier I **2m/25s**

Fast load. Different versions for Editor/Assembler, Mini-Memory and Extended BASIC. Supports three drives. Won't copy proprietary or dead-sectored disks. No frills.

Quality 99 Software, 1884 Columbia Rd.500, Washington, DC 20009, (202) 667-3574.

Quick Copier II **2m/23s**

Medium load. Loads with Editor/Assembler, Mini-Memory or Extended BASIC. Supports four DS/DD drives in any configuration. Selective file copy. Won't destroy sector 0. Will initialize. Copies proprietary disks. This is the only one that sounds a tone when done (very nice feature, the others should have thought of it!). Has display of data as it is transferred from one disk to another. Won't copy dead-sectored disks. Writes over programs on destination disk.

Quality 99 Software, 1884 Columbia Rd.500, Washington, DC 20009, (202) 667-3574.

Copy-Cat **4m/45s**

Slow load. Supports three drives. Copies proprietary disks. Won't copy dead-sectored disks. Extremely slooooow. No frills. Takes many passes.

C&R Distributing, P.O. Box 2168, Acworth, GA 30101, (404) 928-8791.

FORTH BACKUP **2m/54s**

Fast load (when BSAVE'd). Copies proprietary disks. Can be modified to copy up to four DS/DD drives, initialize disks, copy any range of sectors and just about any kind of code. Tells screen number being copied. No frills, as-is.

Available as freeware from the author. If the user wishes to make a donation, I've included our group treasurer's address to mail to. Send disk and return mailer and postage to Jim Lewis, 1907 Trout Valley Rd., Champaign, IL 61821.

Other disk-copy programs are available, and MICROpendium is interested in adding to the list started here. Readers who are familiar with copy programs not mentioned here may submit capsule items in this format for future publication—ED.

BITMAC

Unique program for drawing

By WARREN AGEE

Picking a graphics program for the TI-99/4A is becoming a very difficult task. Not too long ago we had little to choose from; now there are many excellent graphics programs. One of the most recent entries in this field is BITMAC, from DataBioTics.

First of all, BITMAC has all of the "standard" features one expects to find in a program of this type; you are able to manipulate each individual pixel on the screen and control the color of each 8-pixel row. You may draw lines, circles, boxes, plot points, change colors, fill an area, erase, type text, dump the screen to a printer, etc. One feature that is sorely missed is a zoom function, which magnifies an area of the screen to allow very detailed work to be done.

Another feature which I found missing is some sort of "move" function, where an area of the screen can be picked up and moved.

BITMAC does have a copy function, but no "moving" can be done. It also lacks a clipboard-type feature, one which I love in GRAPHX. This is where objects, or portions of a drawing, can be stored in an area of memory called a "clipboard," recalled, moved, and used in any manner you see fit.

But enough of what BITMAC doesn't have and on to the features that make this program unique.

BITMAC contains some rather powerful features not present in any other graphics program for the TI99/4A. They are listed below:

Slide Show
Picture Scrolling
Enlarge
Reduce

Slide Show: This feature is particularly useful for demonstrations and presentations. It allows you to display

Rotate
Mirror
"Merge" Screens
Coprocessor

Review

Report Card

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

Cost: $39.95
Manufacturer:DataBioTics, P.O. Box 1194, Palos Verdes Estates, CA 90274; IEC, 4150 Fox St. Unit A5, Denver, CO 80216
Requirements: Console and monitor or TV, disk system, memory expansion, printer interface and printer

I will deal briefly with each of these features next.

previously created pictures much in the same way you would display a slide show. You may specify manual or automatic mode. You input the names of the pictures you want to display and the sequence in which to display them. The program then loads in each picture in turn; with automatic operation, the program will display each picture for about one minute before loading and displaying the next. With manual operation, hitting the fire button on the joystick calls up the next "frame" of the "slide show."

Picture Scrolling: When in draw mode, you may use the arrow keys to "shift" the screen in any of four directions, thereby adjusting the pixel locations to match the 8-bit boundaries for colors on the 4A screen. This is also useful for creating special effects when "merging" screens (see below).

Enlarge and Reduce: These two functions are sorely missed on the competition, and I was pleased to see them implemented here; however, they do not always work properly. Simply select Enlarge or Reduce, and surround the area in question with a rectangle. It is easy to do, but the results are less than satisfactory; the object is distorted and requires further modification in order to restore it to its original shape. For example, I found that solid areas contain a "checkerboard" pattern once enlarged.

Rotate: I was also very pleased to see a rotate function in BITMAC, one that, again, is missing in its competition. Fortunately, Rotate works flawlessly, and can turn an object 90 degrees at a time. This feature is especially nice to use with text.

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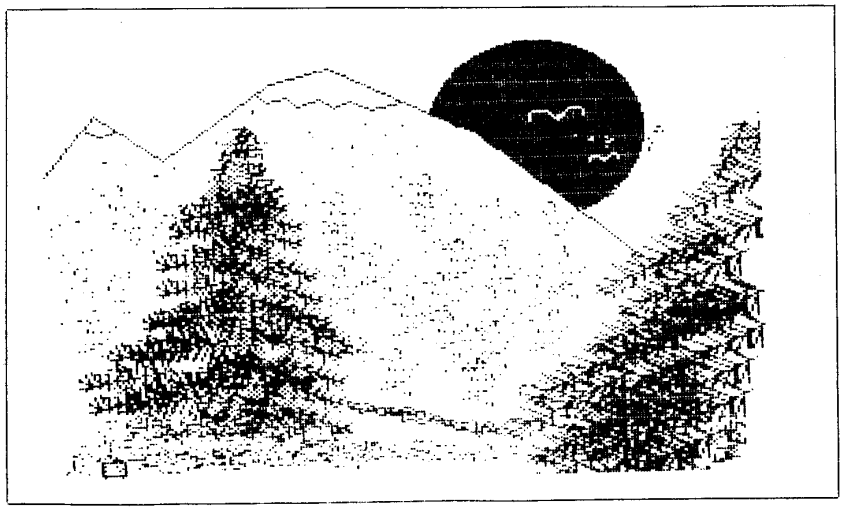

Starcross

Topflight fantasy in space

By JEFF SHAW

The year is 2186 and you are an interplanetary miner cruising through the solar system looking for miniature black holes to power Earth's generators. Suddenly, the mass detector on your ship begins to ring. A huge mass has been detected. You set course for the mass. After a long journey, the mass becomes visible—a huge, derelict spaceship. And the adventure begins....

This is the setting for Starcross, the first in Infocom's series of science fiction adventures. On board the spaceship is an environment as rich in detail as any of Infocom's "worlds." Your quest is to find 10 colored, crystalline rods which will allow you to repair onboard machinery. Eventually, you will need to fix the navigational controls and pilot the invaluable relic to Earth.

While undertaking this venture, you will meet a menagerie of strange and interesting creatures. There is, for instance, a robot who is most happy when he has a mess to clean (wish I had one of those!). There is also a spider-like alien who is interested in knowing the winner of this year's World Cup. You will also have to discover how to thwart a colony of large "rat-ants" as well as a colony of weasel-like aliens who are awed by your spacesuit.

As in other Infocom games, it will be necessary to find a light source since one corridor of the artifact is dark. One risks the wrath of the resident Grues by entering a dark placé. For those who are unfamiliar with Infocom games, a grue is a ferocious, large-fanged creature who lives in dark places and has become Infocom's standard way to force the player to obtain a light source.

It will also be necessary to find some way to replenish the atmosphere. If this is not accomplished, the air on the artifact will eventually become stale, causing death by suffocation for the adventurer.

Review

Report Card

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

Cost: $49.95
Manufacturer: Infocom Inc., 55 Wheeler St., Cambridge, MA 02138
Requirements: Console, monitor or TV, disk system, memory expansion, and Mini-Memory, TI-Writer or Editor/Assembler; printer optional

This game exemplifies Infocom's well-deserved reptutataion for thoroughness, detail and low-key humor. The descriptions of locations and events are exquisitely detailed, providing the raw material for clear and exciting mental imagery. Almost every possible command has been anticipated (if you want a good example of this, try the command, "EAT THE SELF"). The game's wry humor is delightful and is not so heavy-handed as to detract from the mystery of the adventure.

Another aspect of this game is its realism. For example, the mining-ship's course must be set using spherical coordinates. One also finds an example of the coriolis force as well as rotation to simulate gravity. It is not necessary to be familiar with these concepts in order to enjoy the game, but for those who are familiar with them, they only add to the game's enjoyment. One final note about realism: There is neither air nor gravity in deep space!

This adventure is rated "advanced" (the most difficult class). One difficulty arises from the sequence in which puzzles must be solved. In some cases, it will be necessary to solve a certain problem before taking on another one. This is because some piece of equipment might be used up or destroyed in solving the first puzzle when it is needed to solve a subsequent puzzle. Over all, I found that most puzzles were not too difficult to solve, though the last few were tough.

Performance: The game performed flawlessly. I found no way to crash the program.

Ease of use: The game is very easy to load and use. It loads automatically in Extended BASIC. It is necessary to use the "OLD" command to load the program using the other two modules. After the game starts to load, one merely follows the directions on the screen. Commands may be entered in full-length sentences. More than one command may be entered at a time by separating them with periods. This is easier and more satisfying than having to enter commands in two-word sentences as some other interactive fiction games require.

Documentation: The game comes in packaging shaped like a flying saucer, with a generic Starcross manual as well as a special card for the 99/4A. The instructions are clear, colorful and grammatically correct. I applaud Infocom for the excellence of its documentation and wish that certain other companies would take notice.

Value: The value of this software is largely subjective. It depends on how much one is willing to spend for quality entertainment. If you enjoy computer based adventures and science fiction in particular, this game should provide many hours of enjoyment. In the 99/4A world (and perhaps for any other computer) this game ranks among the very best entertainment programs available.

BITMAC—

(Continued from Page 37)

Mirror: This function works like the three previous ones: surround the object in question with a rectangle (which may vary in size, of course). This functon flips the area on the screen about a vertical axis, creating a mirror image of the original. The original object is erased and replaced with its mirror image.

"Merge" Screens: Also called Boolean disk input. With this option you may "overlay" current screen graphics with graphics stored on disk to create special effects. You may "AND," "OR," and "XOR" a screen. Color is not allowed wth this function.

Coprocessor: The coprocess function allows a second computer to take control of BITMAC and calculate the plots. Once set in Coprocess mode, BITMAC awaits commands from the RS232 port, which must be hooked up to a second computer, be it a 99/4A or some other brand. A sample demonstration is included with BITMAC, written in BASIC, which must be run on the second computer. With this option, you may have your second computer calculate complex graphs and plots, and have BITMAC create the screens, for later saving to disk, coloring, XORing, for slide shows, whatever!

Performance: BITMAC uses icons which appear at the left side of the screen, which makes selection of options simple and easy to remember. There are, however, a great number of key-sequences to remember in order to increase/decrease the speed of the cursor, the size of the cursor, erase/draw mode, etc. Another annoyance is the limitation of filenames. You do not have very much freedom in choosing filenames for your pictures when saving to disk. They may consist of only *one* letter: A-Z and a-z. Although this gives you a choice of 52 filenames, it may become difficult to remember just what picture "t" looks like.

Documentation: Documentation is in the form of a professionally done 27-page manual. I found no errors or typos, and everything was clear and complete. I did find one problem: I could not figure out how to fill an object with a color. I could only get it to fill in black.

Value: Compared to the price of other drawing programs, I would say that BITMAC is a fair value. However, two important features are missing from BITMAC that would otherwise make it an excellent value: a zoom feature, for detailed work, and a clipboard. In comparing it to its competition, it resembles TI ARTIST in usefulness more than GRAPHX: it is excellent for artists, but may fall short for "the rest of us." But, the Coprocessor option opens up a very interesting facet of graphics programming that may make it useful for those who own two computers and need to plot scientific graphs.

We have not yet seen "the perfect" graphics program, but we are getting closer. Now if someone would only come out with one that incorporats zoom, clipboard, mirror, rotate, and enlarge/reduce.

(This review was downloaded from the TI Forum on CompuServe.)

XBIV delayed

Myarc began shipping its Extended BASIC Level IV to some distributers in late December, but "they found some bugs," according to Lou Philips, Myarc president.

"Even despite these bugs and setbacks, it is still a very sophisticated piece of software," Philips says. "It has 50 Kbytes of object code, not including routines used in the console."

Myarc's XBASIC Level IV, whose release was originally announced for July, is a cartridge which requires use of Myarc's 128K card. The cartridge comes with a diskette. It is a feature-laden upgrade of Extended BASIC.

Freeware additions

Here are recent additions to Micropendium freeware listings (for complete list send for freeware list (include 50 cents and business-sized SASE or $1) to MICROpendium.

PRBASE—two diskettes, XBASIC, E/A, MMM or TI-Writer, expansion memory required, printer, second disk drive recommended. Fast-access data management system, featuring global search, field search and memory index search. Data sorts in seconds. William Warren, 2373 Ironton St., Aurora, CO 80010.

42 programs—10 XBASIC graphics programs of transformer toys, 7 miscellaneous graphics, 10 XBASIC games, 3 BASIC games, 11 utility and 1 educational. Send $2, blank diskette and stamped, return mailer. Steve Paterson, 2351 Ragan Woods, Toledo, OH 43614.

Search of Xylose—XBASIC, memory expansion an disk system required. Adventure game, first in two-part series. Find Xylose by defeating partner in 5 events. Dave Dalton, 920 Hillview Dr., Marion, IA 52302.

Universal Disassembler—Offers capability to analyze diskettes and disassemble files directly from the diskette as well as from memory. Handles all standard TI object file formats. Requires disk system and memory expansion. Also offered is a two-diskette configuration of TI-Forth to run on 1 or 2 drive systems. Extensive enhancement of TI-Forth with 180 screen limit, rather than 90 as in original TI-Forth. Rene LeBlanc, 8719 E. San Lucas Dr., Scottsdale, AZ 85258.

Rapid Scroll—100 percent assembly program reads D/V80 files and allows users to rapidly window left or right one character at a time or up and down one line at a time. Displays current lin and column positions. Allows previewing of formatting from TI-Writer without printing and eliminates 20-column "hop" of TI-Writer windowing. Requires expansion memory, disk system and E/A, XBASIC, MMM or TI-Writer. Send stamped return mailer and $3-$5 to Jurgen Switalski, 218 Lake St., Northville, MI 48167.

Taxmaster—Tax calculating and printing program to aid in preparation of this year's federal income taxes. XBASIC, memory expansion and disk system required. Printer helpful. Prints final tax return on government's own form. Send $5 for disk, postage and handling. Howard Arnold, 210 Beech Valley Rd., Lewisville, NC 27023.

TE4TH—terminal emulator for the Forth user who wants to download text or Forth screens. Requires E/A, expansion memory and disk system. Includes source and other Forth programs. Send SSSD diskette and stamped return mailer (or $5) to Ken Caruthers, 3537 Faberge Way, Sacramento, CA 95826.

Newsbytes

Quality 99 products

Quality 99 Software has recently released five new products for the TI-99/4A.

They are the QS-RAMDISK, Banner Maker, Softkeys, Screen Dump II and Disk Manager IV.

All require disk, 32K and Extended BASIC.

QS-RAMDISK is said to turn the Foundation 128K card into a true 127-file RAM disk, with no file-size or file-type restrictions, allowing the user to have sequential files, large Extended BASIC programs, etc. According to the manufacturer, it has all the capabilities of a single-sided, single-density disk, only at RAM disk speeds. The manufacturer says the program allows users to read, write and save to the QS-RAMDISK as if it were a regular disk drive, using all the normal BASIC commands. The program is written in assembly language and requires the Foundation 128K card with DSR option (not disk file emulator). It sells for $49.95.

Banner Maker is said to print signs in letters up to six inches high, either horizontally or vertically. The manufacturer says it allows upper and lower-case letters, numerals, punctuation marks and special characters ($, %, &, ?, !, etc.), plus 10 pre-defined characters, and also allows user-designed characters. According to the manufacturer, it is compatible with any printer. Banner Maker sells for $19.95.

Softkeys is said to allow the user to create programmable function keys by defining 10 keys to be whatever command is desired, up to 140 characters each. The program is written in assembly language and sells for $29.95.

Screen Dump II, written in assembly language, is said to allow the user to print the screen, in normal or full-page size, in only seconds by pressing a key. The manufacturer says Screen Dump II requires no programming or hardware modification. It can be used from BASIC, Extended BASIC or command mode. According to the manufacturer, the user controls the column in which the printout will begin. The program prints the screen of certain modules when used with a Load Interrupt switch (sold separately), according to the manufacturer. The program requires a TI, Epson, Gemini, Panasonic, Canon or Prowriter compatible printer.

Disk Manager IV, described by the manufacturer as the only resident disk manager program, is said to be operable from command mode or from a program. The manufacturer says it is ready for "instant use, at any time" after being loaded once, allowing for disk cataloging or initializing or changing file protection from command mode or an Extended BASIC program. According to the manufacturer, Disk Manager IV has all the capabilites of the Disk Manager module except disk tests and includes a HELP command and a menu-driven option. The program is written in assembly language and resides in the assembly language portion of memory. Designed to work with all disk controller cards, it sells for $39.95.

For further information, contact Quality 99 Software, 1884 Columbia Rd. #1021, Washington, DC 20009 or (202) 667-3574.

GPL Assembler

Ryte Data Ltd. announces the release of the GPL Assembler package version 2.1.

According to the manufacturer, the GPL Assembler provides the capabilities to write and assemble true GPL (Graphics Programming Language) programs for the TI99/4A. The manufacturer says GPL was used by TI for their operating system interpreter and many Command Module programs.

GPL gives the user "complete access to the entire computer, the internal operating system including BASIC and all peripherals," according to the manufacturer. The package uses the TI Editor (Editor/Assembler) to write source code which is then assembled with the GPL Assembler. Tagged object code and list files are generated from source code.

Included in each package is the disk software (without the TI E/A Editor which must be copied onto the GPL Assembler disk), documentation and the book *Intern*. The book, the manufacturer says, is a complete listing of TI's operating system—disassembled ROM and GROM code complete with commentary. The Graphic Programming Language used by TI is discussed with syntax, operands, error codes, symbol tables and programming tips, according to the manufacturer.

As GPL is similar to TMS 9900 Assembly, Ryte Data recommends knowledge of assembly language and the internal hardware structure of the TI99/4A. The syntax of GPL is virtually identical to TMS assembly language, says the manufacturer, with the added advantage of being easier to use. Access to all system features and improved screen writing are implemented, according to the manufacturer, who also says that further utilities and tools will be provided to take full advantage of this new assembler.

It requires a TI99/4A console, 32K memory, disk drive, and TI Editor/Assembler package (module and disk). A printer is recommended.

Price is $75 for the full package, $17.95 for the book *Intern* only and $59.95 for the GPL Assembler only. Dealer and distributor inquires are invited by the manufacturer.

For further information, contact Ryte Data, Box 210 Mountain Street, Haliburton, Ontario, Canada K0M 1S0 or (705) 457-2774.

BBS listings offered

Jim Thomas of Pacifica, California, says that he and Frank Schickel have compiled what they believe to be the largest BBS listings (text files) in Northern California.

According to Thomas, the list now consists of about 375 in Area Code

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Newsbytes

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415, 80 in Area Code 408 and 250-300 in California. "Next is international," he says.

He says hard copy files are available for a self-addressed stamped envelope, "a normal SASE if they want just one, but they had better use two 22-cent stamps if they want them all." A disk containing the files will be sent to persons sending him a disk and mailer with return postage. Those sending for them should send the disk "initialized the way they want it," he says, noting that his current files will fit on a single-sided, single-density disk.

Persons desiring the files may write Thomas at 1187 Mason Dr., Pacifica, CA 94004.

Thomas also announces his 24-hour Techie bulletin board, the Capricorn at 415-359-7555.

TI News aids users

The recently-established TI News section of the CompuServe TI Forum is part of the general reorganization of the structure and libraries of the forum, according to sysop Jonathan Zittrain.

"The original purpose of TI News was as a nice front end to the Forum, something to take people from ground zero, take them through a help and tutorial section," he says.

The sections "Using the TI Forum" and "Items of Interest" were originally part of the data libraries. Zittrain notes that the data library reorganization has alleviated the problem of Data Library 3's former excessive length, at a savings to persons browsing the library, since CompuServe users are charged by the hour.

Bull City TIBBS

Roy Gurley, sysop, announces the Bull City TIBBS, a 24-hour bulletin board operating in Durham, North Carolina.

Gurley says that the bulletin board operates 24 hours a day, seven days a week, and has upload and download capability. He says no charge is made for downloading freeware or public domain files or programs.

Phone number for the board is (919) 383-8707.

TI WORLD BBS

Scott Mueller of Elmwood Park, New Jersey, announces that he is running a TI-based BBS called TI WORLD(tm).

He says the board runs 300 baud and will soon be upgraded to 2400 baud and features XMODEM transfers for all computer types, nine message bases and instant access to seven of the bases.

Number for the 24-hour, seven-day BBS is (201) 794-3175.

Spacestation Pheta

T&T Software has released Spacestation Pheta Version 2.0, written in Wycove Forth.

The manufacturers say that the game loads in fewer than 25 seconds and is controlled by the keyboard or joysticks. It features graphics and sound plus sprites.

The game has 79 built-in playing screens. The user, as the spaceman, encounters many strange objects as he explores the abandoned spacestation. Objects include anti-gravity fields, cannons, booters, conveyer belts, secret latters, transporters and materializers. Documentation with graphic examples is included.

The manufacturers say that the editor feature of the game allows the user to view screens before playing them and to use the keyboard to design and play his own screens. Other editor commands let the user change the game speed, view screens, make copies of screens from one disk to another, clear screens, select his own movement control, set solutions for screens he creates and start game play on any screen.

Spacestation Pheta version 2.0 costs $14.95 (Virginia residents add 4 percent sales tax). It requires a TI99/4A computer with 32K memory expansion, disk controller and disk drive and either the Extended BASIC, Editor/Assembler, Mini-Memory or TI-Writer.

Persons may send 50 cents for further information, which includes a copy of the game's instruction manual.

To order or for information, write T&T Software, 109 Tee Circle, Salem, VA 24153.

UK piracy conviction

A Wigan, England, computer firm and two directors were ordered to pay fines totalling 1,500 pounds for selling counterfeit tapes last May, according to a report in the *Manchester Evening News* reprinted in *TI*MES*.

The fines were imposed under the Trade Descriptions Act.

According to the article, the magistrate who heard the case heard that Alan and Michael Brady of Lynkirk Limited, who trade as Blue Chip Computers, had bought two separate consignments of goods in 1983 from Stephen Shaw, proprietor of Stainless Software in Stockport, England.

Shaw complained in February 1984 that Lynkirk was marketing counterfeit copies of his software. The prosecuting attorney said the Bradys copied tapes before supplying them to firms, indicating they were produced by Shaw's company or with his consent. Lynkirk Limited was ordered to forfeit 37 tapes.

Lynkirk Limited had denied five offences of applying false trade descriptions to computer program tapes and five others of supplying tapes indicating the tapes had been produced by Stainless Software. The Bradys had each denied 10 allegations involving tape piracy.

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.

User Notes

Turn numbers into words

The following routine, written by William J. Bullock of Columbus, Georgia, translates numbers into text. Although this version runs out of Extended BASIC, it can be modified to operate out of console BASIC.

The program is designed to operate as a subroutine and should be saved in a merge format. A program used with it would call the subroutine with GOSUB 10000.

The string variable DOLLAR$ is used to hold the word version of the variable AMOUNT in the routine. Bullock used DOLLAR$ because this routine was originally written to convert a dollar amount to words in a check-writing program and DOLLAR$ was a logical choice for the string variable.

A brief test program is included to demonstrate the subroutine. Make sure that you MERGE the subroutine into the test program before RUNning it.

```
10000 REM NUM>WORDS -- A rou
tine to change a numerical a
mount to words.
10001 REM Any amount from 1
to 99999 may be used by the
routine.
10002 REM Written by Wm. J.
Bullock, 3212 College Dr., C
olumbus, GA  31907-2022
10003 REM The program this r
outine is incorporated into
must use AMOUNT as the varia
ble that holds the amount,
10004 REM or else all statem
ents AMOUNT in this routine
must be changed to the varia
ble that does hold the amoun
t.
10009 REM ---ESTABLISHING AM
OUNT IN SCRIPT FORM (DOLLARS
$)---
10010 RESTORE 10040 :: FOR I
=1 TO 9 :: READ W$ :: AW$(I)
=W$ :: NEXT I
10020 RESTORE 10050 :: FOR I
=1 TO 9 :: READ W$ :: AWT$(I
)=W$ :: NEXT I
10030 RESTORE 10060 :: FOR I
=1 TO 9 :: READ W$ :: AWEEN$
(I)=W$ :: NEXT I
10040 DATA ONE,TWO,THREE,FOU
R,FIVE,SIX,SEVEN,EIGHT,NINE
10050 DATA TEN,TWENTY,THIRTY
,FORTY,FIFTY,SIXTY,SEVENTY,E
IGHTY,NINETY
10060 DATA ELEVEN,TWELVE,THI
RTEEN,FOURTEEN,FIFTEEN,SIXTE
EN,SEVENTEEN,EIGHTEEN,NINETE
EN
10070 !GET NUMBER OF 1000s,1
00s,10s AND 1s IN AMOUNT
10080 NOTH=INT(AMOUNT/1000):
: NOHN=INT((AMOUNT-NOTH*1000
)/100):: NOTN=INT((AMOUNT-(N
OTH*1000)-(NOHN*100))/10)
10090 NOON=INT(AMOUNT-(NOTH*
1000)-(NOHN*100)-(NOTN*10))
10100 REM ----------------
10110 IF NOTH=0 AND NOHN=0 T
HEN 10230
10120 IF NOTH=0 AND NOHN<>0
THEN 10170
10130 IF NOTH<10 THEN DOLLAR
0$=AW$(NOTH)&" THOUSAND " ::
 GOTO 10160 ELSE IF NOTH<20
AND NOTH>10 THEN DOLLAR0$=AW
EEN$(NOTH-10)&" THOUSAND " :
: GOTO 10160
10140 IF INT(NOTH/10)=NOTH/1
0 THEN DOLLAR0$=AWT$(NOTH/10
)&" THOUSAND " :: GOTO 10160
10150 DOLLAR0$=AWT$(INT(NOTH
/10))&"-"&AW$(NOTH-(INT(NOTH
/10))*10)&" THOUSAND "
10160 IF NOHN=0 THEN 10180
10170 DOLLAR1$=AW$(NOHN)&" H
UNDRED "
10180 IF NOTN=0 THEN IF NOON
=0 THEN DOLLAR$="" :: GOTO 1
0220 ELSE DOLLAR2$=AW$(NOON)
:: GOTO 10220
10190 IF NOON=0 THEN DOLLAR2
$=AWT$(NOTN):: GOTO 10220
10200 IF NOTH=0 THEN AMOUNT1
=AMOUNT-(NOHN*100)ELSE AMOUN
T1=AMOUNT-(NOTH*1000)-(NOHN*
100)
10210 IF AMOUNT1<20 AND AMOU
NT1>10 THEN DOLLAR2$=AWEEN$(
AMOUNT1-10)ELSE DOLLAR2$=AWT
$(NOTN)&"-"&AW$(NOON)
10220 IF NOTH=0 THEN DOLLAR$
=DOLLAR1$&DOLLAR2$ :: GOTO 1
0240 ELSE DOLLAR$=DOLLAR0$&D
OLLAR1$&DOLLAR2$ :: GOTO 102
40
10230 IF NOTN=0 THEN DOLLAR$
=AW$(NOON)ELSE IF NOON=0 THE
N DOLLAR$=AWT$(NOTN)ELSE IF
AMOUNT>10 AND AMOUNT<20 THEN
 DOLLAR$=AWEEN$(AMOUNT-10)EL
SE DOLLAR$=AWT$(NOTN)&"-"&AW
$(NOON):: GOTO 10240
10240 DOLLAR0$,DOLLAR1$,DOLL
AR2$="" :: AMOUNT1=0
10250 RETURN


1 CALL CLEAR
2 PRINT :"ENTER A NUMBER" ::
 INPUT "FROM 1 TO 99999: ":A
MOUNT
3 GOSUB 10000
4 PRINT :"IN WORDS, THIS NUM
BER IS" :: PRINT DOLLAR$ ::
GOTO 2
```

File sampler for TI-Writer

The following program comes from Sean Sands of North Kingstown, Rhode Island.

He writes: After two years working with TI-Writer, I find that the major fault with the program is that your documents tend to multiply until you've forgotten what file is under what filename. This can become quite a problem, especially around disk organization time. That's why I wrote File Sampler. The program will search an entire disk, find every TI-Writer file (Dis/Var 80), and print the filename and the first fifteen lines of the file. This allows you to see part of each file on paper before you delete it, so you can see if it is worth saving.

The program requires Extended BASIC, a disk system and a printer.

```
100 CALL CLEAR :: CALL SCREE
N(12)
110 INPUT "PRINTER NAME?":PN
$
120 OPEN #3:PN$,OUTPUT
```

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User Notes

(Continued from Page 42)

```
130 INPUT "DISK DRIVE #":DD
140 OPEN #1:"DSK"&STR$(DD)&"
.",INPUT ,RELATIVE,INTERNAL
150 FOR L=1 TO 127
160 INPUT #1:A$,A,J,K
170 IF J<20 THEN 0=J ELSE J=
20
180 IF LEN(A$)=0 THEN 290 EL
SE 190
190 IF ABS(A)<>2 THEN 280
200 OPEN #2:"DSK"&STR$(DD)&"
."&A$,INPUT ,DISPLAY ,VARIAB
LE 80
210 PRINT #3:"FILENAME: ";A$
:
220 FOR I=1 TO 0 :: ! <--- N
OT A ZERO
230 LINPUT #2:Z$
240 PRINT #3:Z$
250 NEXT I
260 PRINT #3
270 CLOSE #2
280 NEXT L
290 CLOSE #1 :: CLOSE #3 ::
END
```

Although the program prompts for a disk drive number, we found that the program crashes if any drive other than DSK1. is used. We made the following modification to line 200, which seems to take care of the problem:

```
200 OPEN #2:"DSK"&STR$(DD)&".
"&A$,INPUT ,DISPLAY ,VARIABL
E 80
```

Then it occurred to us that this program would be just as useful by outputting the data to a monitor rather than a printer. So we made a few more modifications and came up with the following screen output version.

```
100 CALL CLEAR :: CALL SCREE
N(12)
130 INPUT "DISK DRIVE #":DD
140 OPEN #1:"DSK"&STR$(DD)&"
.",INPUT ,RELATIVE,INTERNAL
150 FOR L=1 TO 127
160 INPUT #1:A$,A,J,K
170 IF J<20 THEN 0=J ELSE J=
20
180 IF LEN(A$)=0 THEN 290 EL
SE 190
190 IF ABS(A)<>2 THEN 280
200 OPEN #2:"DSK"&STR$(DD)&"
."&A$,INPUT ,DISPLAY ,VARIAB
LE 80
210 PRINT :"FILENAME: ";A$:
220 FOR I=1 TO 0 :: ! <--- N
OT A ZERO
230 LINPUT #2:Z$
240 PRINT Z$
250 NEXT I
260 PRINT
270 CLOSE #2
280 NEXT L
290 CLOSE #1 :: END
```

We have no doubt that users will create a great many more modifications, including the capability of pausing to delete unwanted files while running the program or changing the file characteristics to allow programs and other file types to be reviewed using File Sampler. A menu offering a selection of file types to be scanned would be very nice. At any rate, this program offers a lot of possiblities.

Summing with TI-Writer

K.D. Wentzel, of Charlotte, North Carolina, writes: "This (program) came about when a friend told me about a file he used with TI-Writer to keep track of the prescriptions he buys during the year. Each time he buys some drugs he calls up this file and adds the name of the medicine purchased, where he bought it and the price. At the end of the year he prints the file for his tax report. However, he says, he wishes there was a way to add up all the purchases without using a calculator." Wentzel devised the following Extended BASIC program to sum up columns of figures in TI-Writer files.

We started by creating a TI-Writer file that included several numeric entries: we placed numbers on five consecutive lines in columns one though seven. We included a dollar sign and decimal point. (The program ignores the dollar sign, or a comma, but will crash if it encounters other non-numeric characters. Since the program prompts the user for the line numbers and the column numbers in which to sum numbers, it is easy to keep the non-numeric characters out of the way. We included alphabetical characters on the same lines with the numbers, but not in columns one through seven.

Having saved the file, we loaded the sum program in Extended BASIC. Following its prompts, we entered the first and last line numbers and the first and last column numbers we wanted summed. We then entered the name of the file we wanted summed. The program then took over, displaying on the screen—and optionally on a printer—each line number and the numeric value in each followed by a total for all the numbers. The arithmetic was flawless.

A few cautions: it appears to be necessary to line all numbers up at the right. In otherwords, if you are going to add numbers in columns 3-9, you want to make sure that the last digit in each number is in column nine.

```
10 ! ************************
20 ! * WORD PROD. DOC.      *
30 ! * NUM. FIELD TOTALS    *
40 ! * By: K.D. Wentzel     *
50 ! * Charlotte, NC        *
60 ! * Copyright (c) 1985 *
70 ! * Ext. BASIC  rev.D    *
80 ! ************************
90 CALL CLEAR :: CALL SCREEN
(12)
100 VL,ACCUM=0 :: DUM$="
                        "
110 DISPLAY AT(12,1):"PROGRA
M TO":"TOTAL NUMERIC COLUMNS
 IN    WORD PROCESSING DOCUM
ENT..."
120 DISPLAY AT(24,1):"USE PR
INTER? (Y/N)" :: ACCEPT AT(2
4,20)VALIDATE("YN")SIZE(1)BE
EP:P$
130 IF P$="Y" THEN OPEN #3:"
PIO"
140 CALL CLEAR
150 IF P$="Y" THEN PRINT "PR
INTER MODE ON...": : :
160 PRINT "INPUT STARTING AN
D ENDING   LINE NUMBERS OF F
```

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User Notes

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```
IGURES IN  DOCUMENT": :"exam
ple (7,22)": : :
170 INPUT "(Start,End): ":SL
,EL
180 IF EL<SL THEN GOSUB 570
:: GOTO 170
190 IF SL<=0 THEN GOSUB 570
:: GOTO 170
200 PRINT : : :"INPUT STARTI
NG AND ENDING   COLUMNS OF T
HE NUMERIC FIELD": :"example
 (66,77)": : :
210 INPUT "(Start,End): ":SC
,EC
220 IF SC<=0 THEN GOSUB 570
:: GOTO 210
230 IF EC<SC THEN GOSUB 570
:: GOTO 210
240 L=(EC-SC)+1
250 PRINT : : :"NAME OF FILE
";
260 INPUT FN$
270 IF LEN(FN$)>10 THEN PRIN
T :"ILLEGAL FILE NAME, TRY A
GAIN" :: GOTO 250
280 CALL CLEAR :: DEV$="DSK1
."&FN$
290 PRINT "Open Disk File an
d Read File": : :
300 OPEN #1:DEV$,DISPLAY ,IN
PUT ,VARIABLE 80 :: R=1
310 PRINT "Rec#";TAB(7);"Val
ue": :
320 IF P$="Y" THEN PRINT #3:
"Rec#";TAB(8);"Value": :
330 IF EOF(1)THEN CLOSE #1 :
: GOTO 510
340 LINPUT #1:A$
350 IF R<SL OR R>EL THEN R=R
+1 :: GOTO 330
360 NF$=SEG$(A$,SC,L):: LE=L
EN(NF$)
370 T1$,T2$=""
380 IF NF$="" THEN VF=0 :: G
OTO 470
390 IF NF$=SEG$(DUM$,1,LE)TH
EN VF=0 :: GOTO 470
400 FOR X=1 TO LE :: T1$=SEG
$(NF$,X,1)
410 IF T1$="," THEN 440
420 IF T1$="$" THEN 440
430 T2$=T2$&T1$
440 NEXT X
450 NF$=T2$
460 VF=VAL(NF$)
470 ACCUM=ACCUM+VF
480 PRINT R;TAB(6);VF
490 IF P$="Y" THEN PRINT #3:
R;TAB(7);VF
500 R=R+1 :: GOTO 330
510 PRINT : : :"The TOTAL is
:";ACCUM
520 IF P$="Y" THEN PRINT #3:
 : :"The TOTAL is:";ACCUM ::
 CLOSE #3
530 PRINT : : :TAB(15);"Agai
n? (Y/N)";
540 CALL KEY(0,K,S):: IF S=0
 THEN 540
550 IF K=89 THEN 90
560 IF K=78 THEN CALL CLEAR
:: END
570 PRINT :"ILLEGAL ENTRY. T
RY AGAIN...": :: RETURN
```

Multi-column printing on the TI

Several readers have inquired about outputting text files in a multi-column format. While the answer eluded us at the time, George Steffen of the Los Angeles 99ers Computer Users Group has devised a program called MULTIPRINT that does exactly that, using TI-Writer files. The program allows you to determine outside margins and automatically determines the "gutter" between columns of type.

Using the program requires some planning, not the least of which is the decision whether to use formatted files or whether to print files that have only gone through the TI-Writer editor. By running text files through the formatter, you can include all the mnemonics, such as LM, RM, IN, FI, AD, etc. We will consider both methods, starting with text files that go through the formatter.

First of all, determine how many columns per page you want to use. Let's say you want to output three columns in pica font using an 80-column printer. Therefore, you could use three columns that are 26 characters wide, which adds up to 78 characters with one a one character gutter separating each column. (You could reduce the number of characters per column or go to elite or condensed fonts to increase the gutter or to add outside margins.

Having determined the number of columns you want, enter the format commands for left and right margin. For example, for three 26-character columns you may set the left margin at 1 and the right margin at 26.

Next, save the text file, exit the editor and load the formatter. Responding to the formatter prompts, enter the filename and then, when prompted for the output device, enter DSKx.FILENAME so that the formatter will print the file to the disk rather than to a printer. Having completed the print to disk routine, exit the formatter, reload the editor and load the print file.

You will notice that every line ends with a linefeed symbol and that the text is formatted according to the format commands that you included. (Note that in a formatted file, the left and right margin set in the editor are ignored.) The linefeed symbols will have to be removed and replaced with a space. The easiest way to do this is to use the global search and replace function. Enter RS from the command mode. Then enter a slash, CTRL U, SHIFT J, CTRL U, another slash, a space and another slash. (The control sequence produces the linefeed symbol that you want the editor to replace.) It is also necessary to replace carriage return symbols and new page symbols with a space. Before executing the RS function, make sure that you are not in the wordwrap mode, which is signified by a sold cursor. Leave wordwrap by entering CTRL 0, which will produce a hollow cursor. If the RS function is executed in the wordwrap mode, the text will be reformatted into one unbroken, 80-column mess.

After replacing the linefeed symbols, check the number of lines in the text. The total number of lines must be divisible by the number of columns you want to print. If there are too few lines,

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User Notes

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add blank lines between paragraphs to even things out. Then save the file to disk, exit the editor and load the MULTIPRINT program.

Here's where everything will bear fruit. MULTIPRINT will prompt you for the name of the file you want to print, the width in characters of the columns you intend to print, the printer name, the printer line length (this depends on which character font you intend to use, ie. 80 for pica) the width of the left and right margin if desired and the number of columns that you want printed across the page. If everything is done properly, you will be rewarded with neat, multiple columns of type. If the calculations are in error, the program will tell you and you will have to make adjustments.

If you think that's a lot of effort just to print multiple columns, there is a much easier way. You may eliminate the necessity of creating a file using the formatter by simply eliminating the carriage returns, linefeeds and new page symbols after creating the document in the editor. Follow the instructions above for operating the MULTIPRINT program. As the text appears in the editor, so it will appear in the printout.

The program is designed to accept up to 300 lines of text. You may be able to increase that number of changing the DIM statement in line 130.

```
100 REM MULTIPRINT-Geo. F. S
teffen, LA 99ers Computer Gr
oup, Oct. 1985
110 REM TI EXTENDED BASIC AN
D MEMORY EXPANSION REQUIRED
120 REM WILL PRINT MULTIPLE
COLUMNS OF ANY TEXT FILE
130 DIM L$(300):: CALL CLEAR
 :: PRINT TAB(10);"MULTIPRIN
T"
140 PRINT :: LINPUT "NAME OF
 INPUT FILE?          ":IF$ :
: INPUT "LENGTH OF INPUT LIN
ES?      ":LL
150 PRINT :: LINPUT "NAME OF
 PRINTER?             ":P$ ::
 INPUT "PRINTER LINE LENGTH?
  ":PL
160 PRINT :"COLUMN SEPARATIO
NS WILL BE CALCULATED." :: I
NPUT "LEFT AND RIGHT MARGIN
SIZE? ":M :: INPUT "NUMBER O
F COLUMNS?   ":C
170 IF (2*(M+C-1)+C*LL)>PL T
HEN PRINT "WILL NOT FIT" ::
GOTO 160
180 OPEN #1:IF$,INPUT ,DISPL
AY ,VARIABLE :: FOR I=1 TO 3
00 :: IF EOF(1)THEN 210
190 LINPUT #1:L$(I):: IF ASC
(L$(I))>127 THEN L$(I)="" ::
 GOTO 210 !DISREGARD TAB SET
TINGS
200 NEXT I
210 CLOSE #1 :: S=INT((PL-(C
*LL+2*M))/(C-1))+LL :: M=M+1
 :: OPEN #2:P$,DISPLAY ,VARI
ABLE PL+1,OUTPUT
220 N=INT((I/1)/C):: FOR I=1
 TO N :: FOR J=0 TO C-1 :: P
RINT #2:TAB(J*S+M);L$(I+J*N)
;:: IF I=1 AND LEN(L$(1))>LL
 THEN J=C
230 NEXT J :: NEXT I :: CLOS
E #2 :: END
240 STOP
```

EXPLORER—

(Continued from Page 28)

sells, but "the latest version of Navarone's Disk Fixer is on a module" and will not run on the 1983 TI99/4A console, which contains modifications by TI which prevent the running of third-party modules.

Price says he holds a California trademark registration on the name, "The Explorer." He says he has been selling the program in his store under that name since 1984. "We do this with programs before we market them in our ads or through our catalog."

In the spring of 1985, Price and Craig Miller of Millers Graphics were on the program of a meeting of the LA 99ers at which Miller demonstrated his Explorer program.

"Never once did he comment on the name," Miller says.

Both men confirm that soon after the meeting, Price wrote Miller to say that Tex-Comp had trademarked the name "The Explorer"and asking Miller to stop using the name.

"I don't think Craig copied the name purposely," he says. "I have asked Craig to stop using the name before the program was commercially released. I hope he is taking steps to change it."

He says he has taken no legal action because, the TI market "is too fragile for people to sue each other," noting that he would take such a course only if he were "really upset."

Miller says that he has not trademarked his product under the name "Explorer" and that he does not believe that a lawsuit regarding the name would stand up in court. He has received legal advice that the term "Explorer" is a "loose trademark," he says.

Miller says the California trademark office advised him that he could register his product under the name "MG Explorer," the name under which it is marketed by Triton Products.

Price says Triton called him before marketing the product under the revised name. Miller says that Triton "didn't want any hassle."

Miller notes that some users who bought the Tex-Comp program have written to Millers Graphics because they did not get the manual which comes with the Millers Graphics Explorer program.

TICOFF slated for NJ

The TI Computer Owners Fun Fest (TICOFF) is set for March 15 at the Roselle Park High School in Roselle Park, New Jersey.

Assistant coordinator for the event is Jeannette Shader. For further information, contact Citron at 981 Townley Avenue, Union, NJ 07083. For information by BBS, call (201) 929-8161.

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