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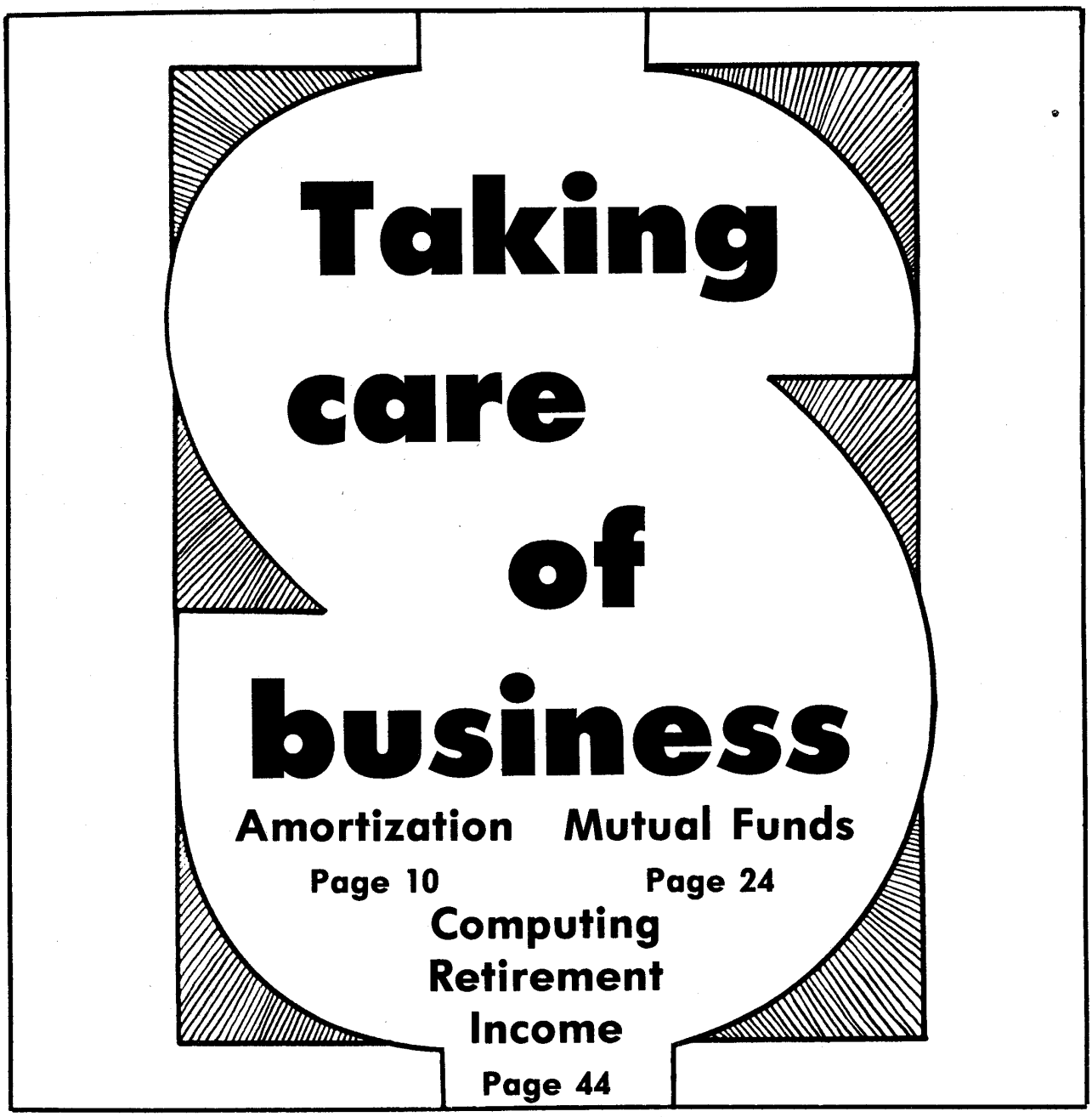

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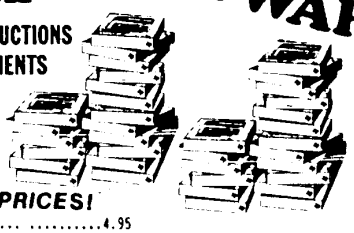

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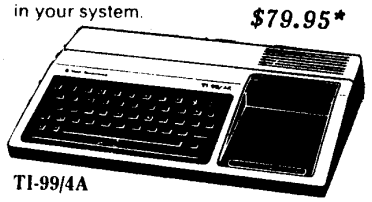

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Programming conventions

Here are some tips to help you when entering programs from MICROpendium:

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

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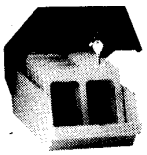

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Comments

Press debugging to finish by year's end

Press, the new word processor from Asgard Software, should be ready by the beginning of the year. According to Chris Bobbitt, owner of Asgard, the programming is done and only the debugging is being completed. As he noted on a conference on GEnie recently, "Programming is a science, debugging is an art."

MDOS V1.14 RELEASED

Myarc has released V1.14 of MDOS. It's the non-hard disk version, so don't bother trying to create or catalog subdirectories. The H version is expected to follow shortly. V1.14 was designed to test Myarc Advanced BASIC (MAB) and you'll notice it by the way the Type command works. When you call a DV/80 file to the screen with V1.14, you'll see that two lines don't scroll. That's because it's in the 80x26 line mode. Two lines are used as "status lines" in MAB. MDOS V1.15 will address this by having a special screen that displays the status lines only when running MAB.

According to Jack Riley, Myarc is in the final stages of debugging MAB and the Pascal runtime interpreter is nearly finished. When MAB and Pascal are finished, they will be sent with the final version of MDOS as a package to registered owners of the Geneve. Registered owners of the Hard and Floppy Disk Controller will similarly receive the final H version of MDOS as well as the latest version of MDM5. The most recent version of MDM5 is V1.28.

WATCH OUT WHEN MIXING VERSIONS OF MDM5

A word of warning to hard disk users: Use caution when mixing MDM5 files from one version with those of another version. The Myarc Disk Manager program has gone through numerous revisions — some minor, some not so minor. Later versions (1.25 and beyond) should not be mixed at all with earlier versions.

In some cases, upgraded files but not the entire program, are made available on bulletin boards so that users may simply substitute some of their existing files for the upgrades. I did that, and inadvertently managed to lose the first 10 sectors of every disk I ran in a floppy drive using the upgraded files. The worst part was that I didn't even know it until I tried to read from the disks several days later.

If in doubt about whether file upgrades are compatible with your existing version, simply stay with your existing version. Or, verify that everything works just as it should before putting your trust in the upgraded files. This means not depending on the on-screen messages that verify successful disk copies. That's how I got into trouble. Rather, copy a few files, or whatever, exit the program and run a directory of the disks from BASIC on a TI or MDOS on a Geneve. If the directory runs without crashing then things should be fine. If it doesn't, you may not want to use the upgraded files.

Also, depending on what EPROM you have in your hard disk controller, you may not be able to use the MDM5 backup command. (This is true for the Geneve only until the H version of MDOS is released because HMDOS will ignore the EPROM entirely.) Versions 7 through 10 support the backup function of MDM5 on the 4A. With earlier versions files can still be backed up one at a time, but that's not as efficient as the backup function. For more information about this, see the Myarc Q&A column.

LOVE ONLINE

Telecommunicating has lots of advantages.

For Walt Howe, TI sysop on The Source, it has led to a Dec. 17 wedding to Hope Tillman. The couple met online on The Source, and their common interests led them to decide to meet in person last July, at which time they spent a day together in Mystic, Connecticut, halfway between their respective homes in Massachusetts and New Jersey.

Throughout the engagement the couple has "talked" on The Source each night, Howe told us, before following up with a voice call. The wedding ceremony, at the bride's home in Lawrenceville, New Jersey, was conducted by the Rev. Barry Traver, a CompuServe sysop and publisher of the "disk magazine" Genial TRAvelER.

The bride is an associate professor of information science at Rider College in Lawrenceville. Her computer is an IBM-PC-compatible Tandy 1000, but Howe says she has been looking with interest at features which are standard on the 4A/9640 but require add-on cards for PCs. After a honeymoon in Maine, the bride plans to finish out the college year in Lawrenceville, after which the couple will live in Massachusetts. Best wishes to them both.

IT'S A RESOUNDING 'NO'

Alright, already. Thanks for the input. Last month I asked whether readers would like MICROpendium delivered in envelopes, for an extra 50 cents a month. I asked that post cards be sent to us with the word YES or NO to indicate opinions. Easily 9 out of 10 said NO. Sometimes they wrote NO all over the postcard, just so we wouldn't miss it. Happily, many of these NO votes also indicated that they've never had a problem with delivery of MICROpendium and that it always arrives in good condition. Frankly, I'm impressed. The post office, for the most part, is doing a good job. Forget I ever asked.

—JK

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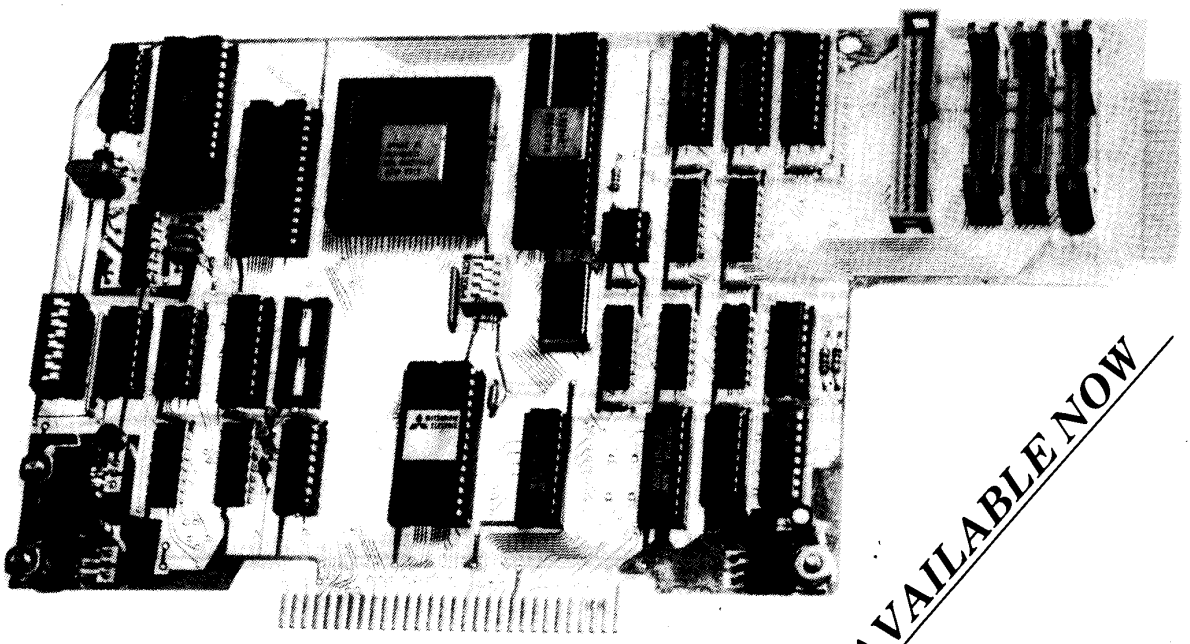

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Feedback

Wild about Harry

I am writing you to say how pleased I am that you have hired Harry Brashear to write MICROreviews.

I have never met Harry in person, but we have become pretty good friends over the last few months. I am in the Army, stationed in Germany, and at best a novice user of the TI99/4A. I ordered The Writers from an ad in MICROpendium. Harry enclosed a sample copy of the Western N.Y. 99er *Interface*. I was impressed with both the manual and newsletter, and decided to join the New York group.

I have been in constant contact with Harry ever since. His help to me has been invaluable. He has given me tips that have helped me get more out of my TI. He has helped me get a Horizon RAMdisk up and running in my P-Box.

I have not been able to find any other TI owners in the area where I am stationed, but through Harry, I have become a full fledged member of the W.N.Y. 99ers. Our group can cater to the needs of isolated users and help them get more out of their machines. I wholeheartedly recommend that any user that can't get help locally join our group. The *Interface* is an excellent newsletter and you will get an answer to your questions, no matter how large or small.

James T. Reynolds
APO, New York

TI in education

A few years ago I gave a console and a TV to a church school in Lena, Illinois, but I also went one step more. I asked to help teach a child, who was having trouble with math, by using the TI, in other words, showing how the computer can be of help to the teacher and how easy it is to operate.

The student was supposed to be at the level where she could add 20+14+12=? in a column. But she was very clever in hiding the fact that she would count the numbers out on her fingers and miss many of the problems, and really having a rough time of it all. So with the TI I wrote a very basic program for her to use. It went 0+1=? up to any combination that would add up to no more than the value of 5 in the answer. I would go three times a week and work with her one hour. After I felt she could handle some more problems, the combination would be increased to the value of six, and so on until all combinations were up to 10+10=?

Now get this! This girl was failing school not only in math but other subjects also. However, after six weeks of work on math with the computer, she could do 60 combinations of math problems in a minute on a timed test we did to see how the student was learning. The teacher was pleased and I was surprised. Now note this: in another six weeks this same student went onto the honor roll and stayed on it for the rest of the year. Thanks to the TI and a program, a young student was able to learn. I might add also that I was glad to give the computer for such a good deal.

Is anyone interested in donating TI stuff to another church school? I have given the Cedarville Baptist Church in Cedarville, Illinois some computer programs to use as an aid to math on the TI console they have. (By the way, no, I'm not a member of either church.) This school is in need to expand the use of the TI. A tax deduction can be taken for anything given to the church for school use. Their needs are: Extended BASIC Cartridge, one PE Box with disk drive and any type of cartridge thaat can be used to help a child to read, do math, etc. Any other type of program that will aid the teacher will be of great value.

In addition, this school would like a second and third complete system — TI computer with PE box and whatever. I know these units will be put to good use, as the students use the present system every day, and it's not games they are playing with — during school hours, that is. (Yes, they do have a few games the students get to play at noon, etc.) The present system they are using is in good shape even with the use it gets so the kids really take care of the stuff.

If you have questions feel free to write. I will personally take the responsibility to work behind the scene and be the program adviser or whatever you'd like to call me. Write Stanley Beyer, 246 W. Garfield, Freeport IL 61032, Attn: Cedarville Baptist Church.

I will see that all information is passed on in an orderly manner and will be the one who will respond as I have the church's permission to work this program for them. However, if anyone would like to call me they may at (815) 233-5758, 7 a.m.-noon only Illinois time please! If someone feels it is needed to call the church school they may do that at (815) 563-4238. Please keep in mind the school has a very limited staff and needs the time to teach.

Also later they will be looking for someone to help change programs to meet a special need here and there if they get the stuff they need to upgrade, so would like to hear from anyone who may like to do a little programming and doesn't know what to program. They may be able to offer a small project from time to time.

When offering equipment shipping cost can be included in the amount of the donation. Also for the records your value of the equipment will be requested and you will receive a receipt after the item is received. Be sure to write first as they do not want to end up with six of one item and none of the next.

Stan Beyer
Freeport, Illinois

More about DISkASSEMBLER

My thanks to Mike Dodd for his mini-review of DISkASSEMBLER Ver. 2 in the November issue of MICROPENDIUM.

Because he had a pre-release copy, however, he was not aware of some of the other features that were included on the final version as released in Chicago: 1) A full DIS/FIX 80 file with external REF's can be loaded into memory in its entirety, with all REF's resolved by use of 2) an external REF table of up to 100 entries can be loaded into memory. It will be used to resolve REF's if a DIS/F IX 80 file is used, AND will be used for labels in preference to the program generated labels (which are now doubled in maximum number). The standard EA table is already in memory—both it and the XB table are supplied on the program disk as well. If you wish to name routines that you have found, they can be added to the REF table and will then be used. 3) If the program finds large blocks of same data (e.g. >0000 or

(See Page 46)

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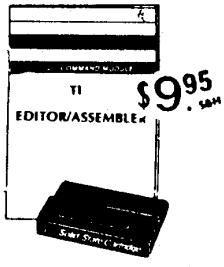

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BASIC

Printing an amortization schedule

By REGENA

Can you believe another year is about to end? A lot has happened in 1988, but one of the main good points is that the TI world is still going strong. There are still many happy TI99/4A users, and groups are continuing to hold annual conventions.

We were sad in recent months to lose two popular TI-ers to cancer. Bill Knecht of Houston wrote many programs, but I especially enjoyed his music/graphics programs. You may still enjoy his programs by asking librarians of users groups. George Steffen of Los Angeles was a fun friend to have. He first told me how much he was doing with hardware when I met him in Las Vegas a few years ago. Since then he made many more friends at various users group conventions at various users group conventions across the United States. All of us should be grateful for the contributions of these two men.

AMOUNT BORROWED = $ 1000.00

INTEREST RATE = 11.50%

	PAYMENT	INTEREST	PRINCIPAL	BALANCE
1	100.00	9.58	90.42	909.58
2	100.00	8.71	91.29	818.29
3	100.00	7.84	92.16	726.13
4	100.00	6.95	93.05	633.08
5	100.00	6.06	93.94	539.14
6	100.00	5.16	94.84	444.30
7	100.00	4.25	95.75	348.55
8	100.00	3.34	96.66	251.89
9	100.00	2.41	97.59	154.30
10	100.00	1.47	98.53	55.77

The New Year is a holiday many of us celebrate with various traditions. My dad always told us never to work on New Year's Day because what you do on New Year's Day is what you will do the rest of the year. We always have lots of food and have a relaxing day. However, the days at the end of the old year are supposed to be filled in preparation for the New Year. The Japanese say the end of the year is the time to clean our houses and to put our finances in order (especially paying off old debts).

One of the best programs for financial information is the TI command module, "Home Financial Decisions. The section I seem to use most often is the one in which you can enter an amount you want to borrow, the interest rate, and the number of payments for the loan. Press a key, and the size of the monthly payment will be given. There are sections for other things about loans and savings accounts plus comparisons for investments.

I have published loan programs before (such as in *BASIC Programs for Small Computers*), but I thought this month I would enhance one of those for an amortization program. My daughter has been asking me for amortization schedules because her bank doesn't give her one. Her loan was one of those that changes interest rates periodically. She also paid amounts different from the original calculated amount per month. I thought you might also have use for this. An amortization schedule is a list by month of each payment with how much goes toward principal and how much goes toward interest — and the resulting balance due.

I have used TI Extended BASIC for this program so I could use the IMAGE statement and PRINT USING to print columns of numbers with two decimal places easily. In a PRINT USING statement, you may specify a format for the output. Line 290 shows how to print some alphabetic characters, then the number with a dollar sign and two decimal places. Each # symbol represents a place a numeral may be printed. Line 340 shows how something is printed with a percent sign after the number.

Line 160 is an IMAGE statement, which is simply a longer format line for numbers to be printed. Again, each # represents a place the characters can be printed. The first ### will have a month number which is a whole number, and the numbers will be right-justified. The other numbers are all dollar amounts with two decimal places, and trailing zeros will be printed if necessary. Later PRINT USING statements may have USING 160 to specify that particular format.

If you do not have TI Extended BASIC, you may use a subroutine to print numbers in dollar format. For example, you may have a number N ($1 or greater). To print it out as a number with two decimal places, you may use this subroutine.

```
100 N=INT(N*100+.5)
110 N$=STR$(N)
120 N$="$"&SEG$(N$,1,LEN(N$)-2&"."&SEG$(N$,LEN(N$)-1,2)
130 RETURN
```

Line 100 multiplies the original number by 100 to get the number of cents (instead of dollars). By adding .5 and using INT, the number is rounded. Line 110 converts the number to a string. Line 120 uses string functions to change N$ to a dollar sign, then all but the last two digits for the dollars, a decimal pint, then the last two digits for the cents. You can then print the new number as N$. If you have varying lengths of numbers, you will need to set up TAB(A) with a variable A depending on the length of the number. If you have cents only, you may need to add leading zeros so you get the dollars and cents properly.

Now, back to Extended BASIC. As you are typing in the program, put your own printer configuration in Line 200 — the printer configuration you usually use when you print within a program or make a listing.

When you run the program, first you will enter the amount borrowed for this loan. Enter a number less than a million and greater than zero (without the dollar sign and commas). Next enter the interest rate in percent (as we usually think of it). For a 10 percent loan, enter 10.

Next enter the monthly payment amount, which must be less than the loan amount. The final question is the number of months using this payment (and interest) amount. Since loans are rarely for more

(See Page 12)

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BASIC—

(Continued from Page 10)

than 30 years, 30 years is the maximum allowed for this program (360 monthly payments).

The variable BB is the balance owed. T is the interest. PAY is the payment amount, and NM is the number of payments. NM1 starts out as 1 for the first month. TT is the amount of the payment that goes toward interest, and PRIN is the amount that goes toward principal. NBB is the new balance. If this balance is negative, the last payment is refigured as interest plus the previous balance due.

Note: if the next-to-last payment leaves a small balance, you would ordinarily add a little extra to that payment to pay off the loan, rather than going a whole month more.

Now let's say you have a variable interest rate account. This may happen when your interest rate on a loan is tied to the money market rate or some other such factor. If you have, for example, a two-year loan, you may not make all 24 payments equally. Suppose after one year the bank notifies you that the interest rate increases. You would enter the amount borrowe, the first interest rate, the payment amount, and then 12 for the number of payments. Since there is a balance still due, the computer will clear the screen, show the balance, and ask for another interest rate, payment amount and number of payments at the new rate and payment.

Here is a specific example (see table, previous page). A loan of $2,000 is taken out at 12 percent interest. The initial payment is $94.15, and you make 12 payments (one year), using that exact payment. After that first year, let's say the interest goes up to 12.5 percent. Enter the new percent. Let's assume you also decide you could afford to make the new payment an even $95. This you do for six months, but then the interest goes up again — to 12.75 percent. Let's continue with $95 payments and enter 12 for the number of months (thinking we'll pay at this rate for a year).

The printout shows the amount originally borrowed and the first interest rate. After the column headings, the amortization is printed, with the payment number at the left. After the first 12 payments, the new interest rate is printed, and the schedule continues for six more payments. The next interest rate is printed. Payment 24 shows the payment necessary to pay off the loan, and since the balance is now zero the program ends.

Each time you change the interest or the payment amount, both variables need to be enteres. However, the interest will be printed only if it changes. The change in payment will appear in the "PAYMENT" column.

Remember that you need TI Extended BASIC to use this program and that you need a printer for the program to run properly. Be sure to type your own printer configuration in Line 200.

If you prefer to save typing effort, you may have a copy of this program by sending $4 to *REGENA, P.O. Box 1502, Cedar City, UT 84720.* Specify the title "Amortization," that you need the TI version, and whether you want cassette or diskette.

Amortization

```
100 REM AMORTIZATION !0091
110 REM TI EXTENDED BASIC !0074
120 CALL CLEAR !2000
130 PRINT "  AMORTIZATION SCHEDULE": : :!231
140 PRINT "YOU MAY ENTER AN AMOUNT      BORROWED, ANNUAL INTEREST    RATE, MONTHLY PAYMENT, AND  NUMBER OF MONTHS." !239
150 PRINT :"THE COMPUTER WILL PRINT AN   AMORTIZATION--PAYMENT,        INTEREST, PRINCIPAL PAID,    AND BALANCE FOR EACH MONTH." !251
160 IMAGE "###       #######.##
     #######.##       #######.##
         #######.##" !232
170 REM MAKE SURE YOUR !166
180 REM PRINTER CONFIGURATION !214
190 REM IS IN LINE 2000! !0040
200 OPEN #1:"PIO" !253
210 NM1=1 :: PRVT=-1 !204
220 PRINT : :"WHAT IS THE AMOUNT BORROWED?" !145
230 INPUT BB !0022
240 IF BB<10000000 THEN 260 !101
250 PRINT :"PLEASE ENTER AN AMOUNT LESS THAN 100000000." :: GOTO 220 !0091
260 IF BB>0 THEN 280 !0083
270 PRINT :"PLEASE ENTER AN AMOUNT       GREATER THAN ZERO." :: GOTO 220 !145
280 BB=INT(BB*100)/100 !0065
290 PRINT #1,USING "AMOUNT BORROWED = $#######.##":BB !142
300 PRINT :"ENTER THE ANNUAL INTEREST    RATE, SUCH AS 11.5" !214
310 INPUT T !230
320 IF T>=0 AND T<=100 THEN 340 !0045
330 PRINT :"INTEREST RATE MUST BE        BETWEEN ZERO AND 100" :: GOTO 300 !254
340 IF T<>PREVT THEN PREVT=T :: PRINT #1 :: PRINT #1,USING "INTEREST RATE = ##.##%":T :: PRINT #1 !0022
350 T=T/1200 !185
360 PRINT :"ENTER PAYMENT AMOUNT." !0011
370 INPUT PAY !124
380 IF PAY<=BB AND PAY>=0 THEN 400 !149
390 PRINT :"PAYMENT MUST BE FROM ZERO TOBALANCE OWED." :: GOTO 360 !131
400 PAY=INT(PAY*100)/100 !0013
410 IF NM1=1 THEN PRINT #1 :: PRINT #1:TAB(11);"PAYMENT       INTEREST        PRINCIPAL       BALANCE": : :!0011
420 PRINT : :"HOW MANY MONTHS FOR THIS     PAYMENT AMOUNT?" !100
430 INPUT NM :: NM=INT(NM+.5)!205
440 IF NM=0 THEN 360 !184
450 IF NM<=360 THEN 470 !0030
460 PRINT :"FOR THIS PROGRAM, THE        MAXIMUM LOAN PERIOD IS       30 YEARS (360 MONTHS)." :: GOTO 420 !0095
470 NM=NM1+NM-1 !0061
480 FOR M=NM1 TO NM !175
490 TT=INT(BB*T*100)/100 !124
500 PRIN=PAY-TT !0075
510 NBB=BB-PRIN !0015
```

(See Page 26)

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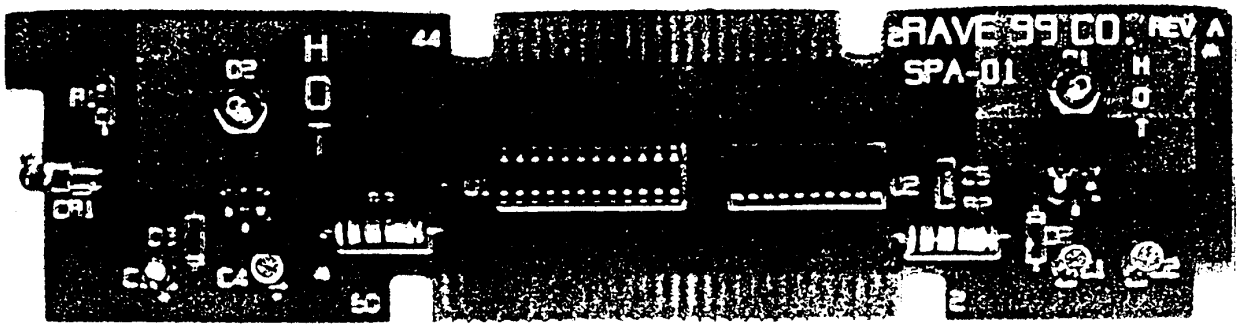

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Constructing Filenames in c99

By WARREN AGEE

(This is the second part of a two-part article. The first part was published in the November issue.)

In my previous article, I explained one of two ways to dynamically construct a filename in c99. The example that illustrated this technique was a program that looked up words in a dictionary. The dictionary is made up of 26 files, one for each letter of the alphabet. Each file is named according to the letter it represents: the file for letter A is DSK1.A, etc. The program decides on which file to open by examining the word in question: the first letter of that word is used as the filename.

The technique used last time involved treating a string as a character array, and accessing each letter of the string by using the array elements (e.g. **fname[0]** for the first letter). There is a slightly more efficient way to build the dictionary filename, and it parallels the first method of using array elements. This time we will access the bytes in the string using pointers and pointer addition.

The theory behind this method relies on the notion that you can examine and manipulate any character string by knowing its address. By *address* I mean the location in memory where the compiler stores the string. The address of the string can also be thought of as the address of the first byte (or letter) of the string. To access successive bytes in the string, all you need to do is add an offset to the original address.

How do we accomplish this feat of using pointers? First of all, instead of declaring a character array to contain a string, you can declare a character pointer variable. This can be done with this line of code:

char *fname;

This line declaraes a pointer variable called **fname** that points to a character. This means that **fname** can only contain a special kind of number: the address (memory location) which points to a character in memory. Instead of containing the actual letters of a string, it *points* to the letters of the string. Note that at this point, **fname** does not point to anything in particular; we need to initialize it first. The following line will do the job:

fname="DSK1. ";

This line should be confusing you — I told you in my first article that you cannot assign a string to a variable as in BASIC! Ah, this is different. I am not storing a *string* into **fname**; I am storing the *address* of the string into **fname**. Remember, **fname** can only contain an address to a char, so it is impossible to store the entire string in **fname**.

Whenever the compiler sees a string literal (letters enclosed with quotes), it stores the string somewhere in memory. You don't know where, and you don't really need to know where. The compiler keeps track of the string's address. Wherever you use a string literal in your code, you are really using its address. For example, when you pass a string literal to a function (like **printf("Hello there\n")**), you are really passing the *address* of the string. Similarly, if you assign a string literal to a variable (like the line of code above), you are really assigning the string's *address* to the variable.

When the above line of code is reached, **fname** will contain the address of the first byte of the string "DSK1. " (excluding the quotes, of course). At this point you don't know the actual address, but you have it stored in a pointer variable; that's all that counts right now. (Note: you can print out the address if you desire.)

Now let's discuss the third line. It will store the first byte of the word in question in the sixth byte of the filename:

***(fname+5=word[0];**

The variable **word** contains the word we are examining, and assume that it was declared the same as before, as a character array. To access the first byte of the string (which is what we need), use a subscript of zero.

We now want to store this letter in the sixth position of the filename. You shouldn't use array notation, as **fname** was not declared as an array. Note that **fname** contains an address that points to the first byte of the filename; you must add an offset to access the sixth byte: **fname+5**. Since **fname** points to the first byte, **fname+1** points to the second byte, and **fname+2** points to the third byte. Offsets are one less than the position for which you are shooting. To access the sixth byte we use **fname+5**, which is just another address. Now that we have the address, we need to access the position pointed to by the address; use the indirection operator (*). Thus we have ***(fname+5)**.

To reiterate this last concept, the line ***(fname+5)= word[0]** retrieves the character in the first byte of **word** and stores it at a position pointed to by **fname+5**. The position pointed to by **fname+5** is the sixth character in the string 'DSK1. '.

The three lines of code presented here work just fine, but there is a slight problem: we use array notaton (**word[0]**) and pointer notation (***(fname+5)**) in the same line; that is bad form. A better way is to reference **word** using pointers. How would we do that? Here's a hint: using the name of the array, without any subscripts yields the address of the array. Now we have the same situation as with **fname**. To get the address of the first element, add an offset equal to a number one less than the position: 0. So now we have:

***(fname+5) = *(word+0);**

But wait ... since any number plus zero is just the number, the offset isn't necessary:

***(fname+5 = *word;**

We can now state a couple of very basic rules about arrays and pointers:

1. An array name, used alone with no subscripts, yields the address to the first element of the array.

2. To decide what offset to use to access a byte in a string, subtract 1 from the position you need to reference. This is because all counting starts at zero: position 1 = offset 0, position 2 = offset 1, etc.

3. Array notation is converted to pointer arithmetic by the compiler; **word[0]+120)**. Therefore, you can reference an array using array or pointer notation: the two are equivalent in many ways, including those dealt with in this article.

CONCLUSION

The whole point of this discussion was to get you used to working with pointers in relation to strings. Pointers may seem wierd and hard to understand, but a good knowledge of them is essential if you plan on manipulating strings to any degree. There are many, many ways to work with strings, and if you can establish a comfortable relationship with pointers, you will ultimately be a much better C programmer.

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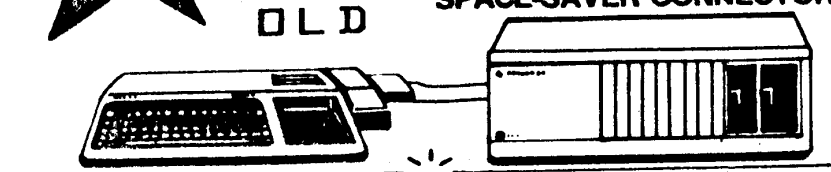

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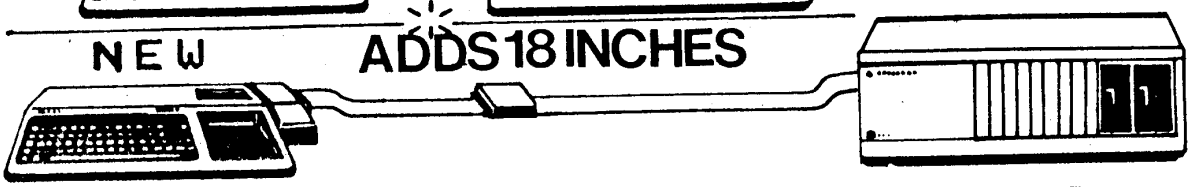

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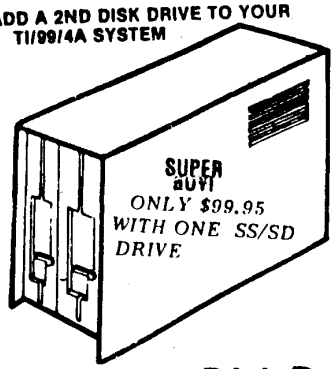

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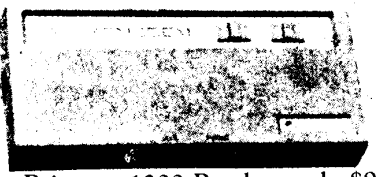

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Demystifying assembly

Adding features to MICRO-WORD

By JOHN BIRDWELL

Before I begin I'd like to say that it was a pleasure meeting several readers at the recent TI Faire in Chicago.

This month we will be adding several features to our MICRO-WORD program. To accomplish this required that the method by which we will be buffering data be established. This will require some explanation as it may appear to be confusing. There are several internal buffer control characters which we will be using, with more to follow. I will explain each of these in detail as well as the logic behind using them.

TLCHR (Hex FE) — The current tab line image, as well as page length, is stored in the buffer and is "framed" by a tab line control character. This is done to allow for different page lengths and tabs/margins within a document. The reason for "framing" this sequence is so that it can be detected when scanning forward or backward through the buffer. Since we are making this into a page oriented word processor we will later be able to a column mode of operation.

SEOL (Hex FD) — This is a soft end of line control character. Its purpose is to denote where a line which does not end in either a space or a carriage return ends. In other words a full line which contains no spaces therefore word wrap can not split the line anywhere.

ESPAC (Hex FC) — The final space on a line is changed into this control character so that the SHOW routine knows where a line ends. This character is changed back into a space when it is no longer at the end of a line due to deletes or inserts.

ADD FUNCTION KEYS

Insert Mode (FCTN/1) — Prior to a character being placed into the buffer the variable INSFLG (line 90) is tested to see if it is set to a non-zero value through the use of the ABS instruction. This instruction sets what is in either a register or a variable to its absolute value and sets the EQUAL status bit if the contents is a zero. The DATA statement following the BL to MAKSPC (lines 92-93) indicates the amount of space that is needed for the insert. The reason using this method instead of just making space for a single character is so that when we add the ability to move blocks of data we can open up the buffer for it without having a separate routine to do so. Insert mode is toggled on or off on each press of FCTN/1.

Delete (FCTN/2) — This deletes a character from the bufer at the current cursor location. This also uses the same DATA statement method used in insert for the same reasons.

You will also notice that the current mode of operation, either type or insert mode, is indicated on line 24 of the display. The rest of this line will be established later.

If this code still appears confusing please let me know and I'll go through a more detailed explanation of it. Remember is program is in a development state so there may be times where everything does not function 100 percent yet. That is what debugging a program is for and you need to start to try your hand at it so feel free to fix and bugs you find. I'll report them to you as I go but don't be afraid to try yourself its the only way you'll learn.

Before we get to the code there is a variable which is currently in the program which we will no longer be needing. This is CURPOS. So go through each of the files, using the Find String operation, and delete all lines containing reference to CURPOS. If the line currently contains a label move this label to the start of the following line.

If you would like to obtain a copy of this source code send $3 plus a blank, formatted diskette and a stamped self-addressed mailer to John Birdwell, 1310 Kent Court, Wheaton, Il 60187.

MICRO-WORD

```
0001
0002  CHANGE THE TABS DATA IN THE MICRO-EQU FILE TO APPEAR AS FOLLOWS
0003
0004  * A DEFAULT TAB TABLE IN THE IMAGE OF TI-WRITER
0005  * ALL TABS ARE >86 GREATER THAN THEIR POSITION RELATIVE TO 0
0006  *
0007  ********************************************************
0008  * These 2 lines are new
0009  TLCHR  BYTE >FE              * Tab line flag character
0010  PAGLEN BYTE 55               * Length of page
0011  ********************************************************
0012  TABS   BYTE >80              * >80 = MARGIN  (LEFT)
0013         BYTE >8C              * >86 = LEFT MARGIN OF 0 THIS WILL BE COLUMN
0014         BYTE >80              * NOW RIGHT MARGIN
0015         BYTE >D1              * RIGHT MARGIN AT 75 * MAKE LESS THAN 27 FOR
0016         BYTE >86              * NOW TABS STARTING WITH LEFT MARGIN
0017         BYTE >8A              * LETS SPACE THEM 10 APART STARTING A COL 5
0018         BYTE >94              * A MAXIMUM OF 16 TABS
0019         BYTE >9E
0020         BYTE >A8
0021         BYTE >B2
0022         BYTE >BC
0023         BYTE >C6
0024         BYTE >D0
0025         BYTE >D5              * SET UNUSED TABS TO CLOUMN 80
0026         BYTE >D5
0027         BYTE >D5
0028         BYTE >D5
0029         BYTE >D5
0030         BYTE >D5
0031         BYTE >D5
0032         BYTE >80              * MARGIN AGAIN
0033         BYTE >86              * BACK TO COLUMN 0
0034  ********************************************************************
0035  * This line is new
0036         BYTE >FE              * TLLFG FRAMES THE TAB LINE
0037  ********************************************************************
0038
0039  ADD THE FOLLOWING 2 LINES TO THE EQU SECTION OF MICRO-EQU
0040  *
0041  MAXCOL EQU  132              * Maximum column length
0042  TLLEN  EQU  25               * Length of internal tabline
0043
0044  CHANGE THE LINE IN MICRO-EQU WITH THE LABEL FTBTAB AS FOLLOWS
0045  *
0046  FTNTAB DATA IGNORE,IGNORE,DELETE,INSERT    * FCTN 7 4 1 2
0047
0048  ADD THE FOLOWING 2 LINES TO THE DATA SECTION OF MICRO-EQU
0049  *
```

(See Page 17)

Demystifying assembly

(Continued from Page 16)

```
0050  EOD    DATA 0                  * Location of end of data flag
0051  INSFLG DATA 0                  * Insert on flag 0=type >FFFF=insert
0052
0053  ADD THE FOLLOWING TO THE BYTE SECTION OF MICRO-EQU
0054  *
0055  SEOL   BYTE >FD                * Soft END OF LINE value
0056  ESPAC  BYTE >FC                * Value for a space at end of line
0057  TYP    TEXT 'TYP'              * Type mode
0058  INS    TEXT 'INS'              * Insert mode
0059  NULL   BYTE 0                  * Null value
0060
0061  CHANGE THE MICRO-INIT FILE TO REFLECT THE FOLLOWING CHANGES
0062  *
0063  * NOW BUILD THE TAB LINE AND DISPLAY IT
0064        BL   @TABSET             * GO SET IT UP
0065        MOV  @EOE,R0             * NOW SET CURSOR POSITION TO LEFT MARGIN
0066        A    @LMAR,R0            * ADD IN LEFT MARGIN
0067  *
0068        MOV  @LMAR,R6            * SET R6 TO INITIAL DISPLAY POSITION
0069        MOV  @ONELIN,@DRCOL      * Set right display column
0070        DEC  @DRCOL              * Correct to column position (39 for a 4a)
0071        LI   R15,FREE            * Set r15 to start of data store
0072        MOVB @FF,*R15            * Set to end of data
0073  ********************************************
0074  * THE FOLLOWING 2 LINES ARE NEW
0075        MOV  R15,@EOD            * Save end of data flag location
0076        BL   @TLMOV              * Move a copy of tab line image into buffer
0077        BL   @SETMOD             * Display current mode as type
0078        DATA TYP
0079  ********************************************
0080        MOV  R6,R14              * Set to cursor position on line
0081        B    @MAIN               * INITIALIZATION COMPLETE BEGIN THE PROGRAM
0082
0083  REPLACE THE CURRENT SHOW ROUTINE IN THE MICRO-DISP FILE
0084  WITH THE FOLLOWING
0085
0086  *
0087  * THIS ROUTINE WILL DISPLAY A CHAR. SAVE IT TO MEM. AND INCREMENT THE
0088  * CURSOR POSITION AS WELL AS SHIFTING THE DISPLAY IF NEEDED
0089  *
0090  SHOW   ABS  @INSFLG             * Is insert on
0091        JEQ  SHOWNI              * No
0092        BL   @MAKSPC             * Make room for inserted character
0093        DATA 1                   * Size of 1
0094        MOVB @NULL,*R15          * Make character there now a null
0095  SHOWNI MOVB *R15,R5            * Save current character
0096        MOVB R4,*R15+            * Load key to memory
0097        CB   @FF,R5              * At the end of memory now
0098        JNE  SHOW1               * No
0099        MOVB @FF,*R15            * Yes set new end of memory
0100        MOV  R15,@EOD            * Save end of data location
0101        CI   R15,>FFF8           * At the end of useable memory?
0102        JNE  SHOW1               * No
0103        DEC  R15                 * Yes backup
0104        B    @MAIN               * and get out
0105  SHOW1  CB   R4,@CR              * Last key a carriage return
0106        JNE  SHOW2               * No
0107        MOV  @LMAR,R14           * Set cursor on line position
0108        CLR  @DLCOL              * Set display left column to zero
0109        MOV  @ONELIN,@DRCOL      * Set display right column to display width
0110        DEC  @DRCOL              * Correct to column number
0111        A    @ONELIN,R6          * Set cursor to start of next line
0112        BL   @BEGLIN             * Point to beginning of this line
0113        A    @LMAR,R6            * Plus left margin
0114        C    R6,@EOE             * Go beyond display
0115        JLT  SHOW2               * Not yet
0116        BL   @MOVUP              * Move display up 1 line
0117  * Now display the screen
0118  SHOW2  BL   @REMAP             * Now make sure buffer is setup for display
0119  * Now calculate the cursor position on the line
0120        CLR  R0                  *Init for counting the distance from start
0121        MOV  R15,R1              * of line
0122  SHOW2A DEC  R1
0123        CB   *R1,@ESPAC          * Got a eol space
0124        JEQ  SHOW3               * Yes
0125        CB   *R1,@CR             * Got a carriage return
0126        JEQ  SHOW3               * Yes
0127        CB   *R1,@TLCHR          * Got a tab line flag
0128        JEQ  SHOW3               * Yes
0129        CB   *R1,@SEOL           * Got an end of line flag
0130        JEQ  SHOW3               * Yes
0131        INC  R0                  * Add 1 to distance
0132        JMP  SHOW2A              * Try again
0133  SHOW3  MOV  @LMAR,R14
0134        A    R0,R14              * Set position on display line
0135        BL   @BEGLIN             * Set to start of line
0136        MOV  R14,R7              * Get column on line
0137  SHOW3A C   R7,@ONELIN          * Column less than display line length
0138        JLT  SHOW3B              * Yes
0139        S    @DSCROL,R7          * Subtract line length
0140        JMP  SHOW3A              * Try again
0141  SHOW3B A   R7,R6               * Set display column
0142  SHOW3C C   R14,@DRCOL          * Beyond right display column
0143        JLE  SHOW3D              * No
0144        A    @DSCROL,@DLCOL      * Add line scroll amount
0145        A    @DSCROL,@DRCOL      *
0146        JMP  SHOW3C              * Try again
0147  SHOW3D C   R14,@DLCOL          * Column less than left display column
0148        JGT  SHOW4               * No
0149  SHOW3E CLR @DLCOL              * Set to left window
0150        MOV  @ONELIN,@DRCOL      * set right display column
0151        DEC  @DRCOL              *
0152        JMP  SHOW3C
0153  SHOW4  CLR  R0                 * Start of display
0154        MOV  @DLCOL,R1           * Left display column start
0155        AI   R1,LBUILD           * Add start of line build for display start
0156        MOV  @ONELIN,R2          * Display for line length
0157        LI   R0,22               * Show 22 lines
0158        MOV  @BEGDSP,R7          * Location in data to start
0159  SHOW5  LI   R3,LBUILD          * Clear line build to spaces
0160        LI   R4,'  '             * 2 spaces at a time
0161  SHOW5A MOV  R4,*R3+            * Load 2 spaces
0162        CI   R3,LBUILD+MAXCOL    * Done last column
0163        JNE  SHOW5A              * If not do 2 more
0164        MOV  @LMAR,R3            * Start fill at left margin
0165        AI   R3,LBUILD           * Position into build line
0166  SHOW5B MOVB *R7+,R5            * Save write to write
0167        CB   @TLCHR,R5           * Tab line character?
0168        JNE  SHOW5C              * No
0169        AI   R7,TLLEN-1          * Yes skip over it
0170        JMP  SHOW5B
0171  SHOW5C CB  @FF,R5              * End of text
0172        JEQ  SHOW7               * Yes go clear the rest of display
0173        CB   @ESPAC,R5           * At last display column
0174        JEQ  SHOW6               * Yes
0175        CB   @SEOL,R5            * Try EOL space
0176        JEQ  SHOW6               * Yes
0177        MOVB R5,*R3+             * Load byte to line build
0178        CB   @CR,R5              * Just load a hard return
0179        JNE  SHOW5B              * No continue
0180  SHOW6  BLWP @VMBW              * Show this line
0181        A    @ONELIN,R0          * Next display line
0182        DEC  R0                  * Done 22
0183        JNE  SHOW5               * No do next line
0184  SHOW6A B   @MAIN               * Done
0185  SHOW7  BLWP @VMBW              * Show the last line
0186        LI   R3,LBUILD           * Prepare to space out the rest of display
0187        LI   R4,'  '
0188  SHOW7A MOV  R4,*R3+
0189        CI   R3,LBUILD+MAXCOL
0190        JNE  SHOW7A
0191  SHOW7B A   @ONELIN,R0          * Next line
0192        DEC  R0                  * All done
0193        JEQ  SHOW6A              * Yes leave
0194        BLWP @VMBW               * Place out line
0195        JMP  SHOW7B              * Do next
```

(See Page 18)

Demystifying assembly

(Continued from Page 17)

```
0196  *
0197
0198  ADD THE FOLLOWING TO THE END OF THE MICRO-DISP FILE
0199
0200  *
0201  TLMOV  MOV  R11,@TLMOV2+2     * Save Return address
0202         BL   @MAKSPC           * Make space for 24 characters
0203         DATA TLLEN             * Total length of tab line info
0204         JMP  NOROOM            * Error return no room in buffer
0205         LI   R1,TLCHR          * Tab line flag
0206         LI   R2,TLLEN          * Length to move
0207  TLMOV1 MOVB *R1+,*R15+        * Move a character
0208         DEC  R2                * Moved all?
0209         JNE  TLMOV1            * Not yet
0210  * The actual return address is set by the instruction MOV  *R11,@TLMOV2+2
0211  * Since R11 contains the return address moving it into the memory location
0212  * pointed to by the address of label TLMOV2 plus 2, to skip the branch
0213  * instruction,  will cause the branch to return to the proper location
0214  TLMOV2 B    @0                 * Return to the calling routine
0215  *
0216  NOROOM B    @MAIN
0217  * The following routine will create an open area in the memory buffer
0218  * into which data can be inserted without overlaying the current data
0219  MAKSPC MOV  *R11+,R2           * Get the amount of space to make in buffer
0220         MOV  @EOD,R1            * Get address of end of data flag
0221         MOV  R1,R3              * Get a copy of this
0222         A    R2,R1              * Add the amount of space needed to this
0223         CI   R1,>FFF8           * Make sure there is room
0224         JLE  MAKSP1             * There is room
0225         RT                      * Return no room available
0226  MAKSP1 MOV  R1,@EOD            * Set new end of data addres
0227  MAKSP2 MOVB *R3,*R1            * Begin to move data down in buffer
0228         DEC  R3                 * Backup a byte
0229         DEC  R1
0230         C    R1,R15             * Moved all needed?
0231         JNE  MAKSP2             * Not yet
0232         INCT R11                * Good return
0233         RT
0234  *
0235  * This routine deletes the number of characters in the buffer based
0236  * upon the DATA word value following the BL @DELCH statement
0237  * Buffer address must be in R0 on entry
0238  *
0239  DELCH  MOV  *R11+,R4           * Get the number to delete
0240         S    R4,@EOD            * Subtract this # from EOD pointer
0241         A    R0,R4              * Add this to the start address of delete.
0242         MOV  R0,R5              * Don't mess with callers R0
0243         DEC  R5                 * Setup for loop
0244  DELCH1 INC  R5                 * Next position to put data
0245         MOVB *R4+,*R5           * Move a byte up in buffer
0246         CB   *R5,@FF            * Moved all the data
0247         JNE  DELCH1             * No
0248         RT
0249  ************************************************
0250  * This routine will adjust the current page for *
0251  * line wrap, inserts, deletes and type overs    *
0252  ************************************************
0253  *
0254  * On entry the starting buffer position is in callers R15
0255  REMAP  MOV  R15,R0             * Get the starting memory buffer address
0256  *
0257  * This loop will scan backwards in buffer to the start of current
0258  * line. To do this it must test if an internal tab line sequence is found
0259  * or a hard return,end of line flag or a end of line space and scan back
0260  * through the buffer until it inds it.
0261  *
0262  REMAP1 CB   *R0,@TLCHR         * At the start of page
0263         JEQ  REMAP2             * Yes
0264         CB   *R0,@CR            * Found hard return
0265         JEQ  REMAP2
0266         CB   *R0,@SEOL          * Found a soft end of line
0267         JEQ  REMAP2
0268         CB   *R0,@ESPAC         * End of line space
0269         JEQ  REMAP2
0270         DEC  R0                 * Scan back another position
0271         JMP  REMAP1
0272  REMAP2 MOV  @CPL,R1            * Get the maximum line length
0273         CLR  R3                 & Clear last space address
0274         INC  R0                 * Next buffer position
0275  REMAP3 CB   *R0,@FF            * At end of data
0276  * NOTE: The $ in the $+4 of the next instruction indicates the current
0277  * address. The +4 means to add for to it. This allows jumping without
0278  * adding a label.
0279         JNE  $+4                * No
0280         RT                      * If so done
0281         CB   *R0,@TLCHR         * Start of a new page
0282         JNE  $+4                * No
0283         RT                      * Yes done
0284         CB   *R0,@ESPAC         * Got an end of line space character
0285         JNE  REMAP4             * No
0286         MOVB @SPACE,*R0         * Change it to a display space
0287         MOV  R0,R3              * Save this buffer address
0288         JMP  REMAP6             * Continue
0289  REMAP4 CB   *R0,@SEOL          * Got a soft end of line
0290         JNE  REMAP5             * No
0291         MOV  R11,R12            & Save rtn
0292         BL   @DELCH             * Go delete it from the buffer
0293         DATA 1                  * Do 1 character
0294         MOV  R12,R11            * Restore
0295  REMAP5 CB   *R0,@SPACE         * Got a space
0296         JNE  $+4                * No
0297         MOV  R0,R3              * Save its buffer address
0298  REMAP6 INC  R0                 * Next buffer position
0299         DEC  R1                 * Reached the end of line
0300         JNE  REMAP3             * No
0301  * Reached the end of line.
0302  * If the next position is an end of line flag or a end of line space
0303  * continue with the next line.
0304  * If not the last space is made an end of line space to do a word wrap
0305  * If a space is not present on the line, indicated by a value of 0 in R3
0306  * then an end of line flag is inseted into the buffer.
0307  *
0308         CB   *R0,@ESPAC         * Next character an EOL space
0309         JEQ  REMAP2             * Line done continue
0310         CB   *R0,@SPACE         * Is it a space
0311         JNE  REMAP8             * No
0312  REMAP7 MOVB @ESPAC,*R0         * Convert it into a EOL space
0313         JMP  REMAP2             * Line done
0314  REMAP8 MOV  R3,R3              * Any spaces on this line
0315         JEQ  REMAP9             * No must insert an EOL flag
0316         MOV  R3,R0              * Point to the last space on line
0317  RMAP8A A    @ONELIN,R6         * Move to next display line
0318         C    R6,@EOE            * Go beyond display
0319         JLT  REMAP7             * No
0320         MOV  R11,R12
0321         BL   @MOVUP             * Move display up 1 line
0322         MOV  R12,R11
0323         MOVB @ESPAC,*R0
0324         JMP  REMAP2
0325  REMAP9 CB   *R0,@SEOL          * Already have an EOL flag here
0326         JEQ  RMAP8A             * Yes line done
0327         MOV  R11,R12
0328         MOV  R0,R15             * Put buffer position where insert needs it
0329         BL   @MAKSPC            * Make room in buffer for EOL flag
0330         DATA 1
0331         NOP
0332         MOV  R12,R11
0333         MOVB @SEOL,*R0          * Put EOL flag into buffer
0334         INC  R15                * Increment buffer position
0335         JMP  RMAP8A             * Continue
0336  *
0337  MOVUP  MOV  @BEGDSP,R1         * Start of display memory
0338  MOVUP1 CB   *R1,@ESPAC         * Got an EOL space
0339         JEQ  MOVUP2             * Yes
0340         CB   *R1,@SEOL          * Got an EOL flag
0341         JNE  MOVUP3             * No
0342  MOVUP2 INC  R1
0343         JMP  MOVUP4
```

(See Page 19)

Demystifying assembly

(Continued from Page 18)

```
0344 MOVUP3 CB   *R1+,@CR          * Got at hard return
0345        JNE  MOVUP1            * Yes
0346 MOVUP4 MOV  R1,@BEGDSP        * Set new start of display
0347        S    @ONELIN,R6        * Backup a display line
0348        RT                     * Continue
0349
0350 ADD THE FOLLOWING LINES TO THE MICRO-KEYS FILE
0351
0352 *
0353 ************************************
0354 * For now back space will only work on the current line
0355 *
0356 ******** BACK SPACE ****************
0357 BACK   JEQ  BACK1             * YES
0358        DEC  R6
0359        DEC  R14
0360        DEC  R15               * Backup 1 memory position
0361        C    R14,@DLCOL        * Before left margin
0362        JGT  BACK2             * No
0363        A    @DSCROL,R6        *
0364        B    @SHOW3E           * Show screen again
0365 BACK1  B    @MAIN             * Ignore key
0366 BACK2  B    @SHOW4
0367 *
0368 * Insert is set on or off by pressing FCTN/2
0369 * Its mode is indicated on the line 24 of the display
0370 *************** INSERT *************
0371 INSERT ABS  @INSFLG           * Is insert on
0372        JEQ  INSON             * No turn it on
0373        CLR  @INSFLG           * Turn off insert
0374        BL   @SETMOD           * Change operation mode
0375        DATA TYP               * Make type mode
0376 INSBK  B    @MAIN
0377 INSON  SETO @INSFLG           * Turn on insert
0378        BL   @SETMOD           * Change mode
0379        DATA INS               * To insert
0380        JMP  INSBK             * Return to main
0381 *
0382 * Delete will delete the character at the current cursor location
0383 *
0384 *************** DELETE ***********
0385 DELETE MOV  R15,R0            * Current buffer location
0386        BL   @DELCH            * Delete current character
0387        DATA 1                 * Do 1 character
0388        B    @SHOW4            * Update display
0389 *
0390 * Set a new mode of operation (TYPE,INSERT,MOVE...etc)
0391 * The DATA word following BL indicates the location of the mode message
0392 *
0393 SETMOD LI   R0,23             * Get correct position for mode
0394        MPY  @ONELIN,R0        * Line x Line length
0395        MOV  R1,R0             * Now have correct line
0396        AI   R0,21             * Add in offset
0397        MOV  *R11+,R1          * Get address of mode
0398        LI   R2,3              * Length is 3
0399        BLWP @VMBW             * Show it
0400        RT
```

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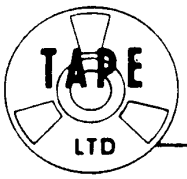

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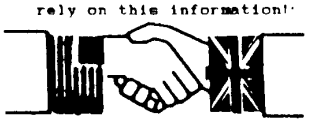

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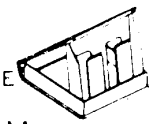

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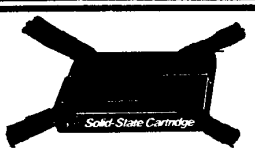

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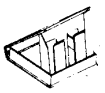

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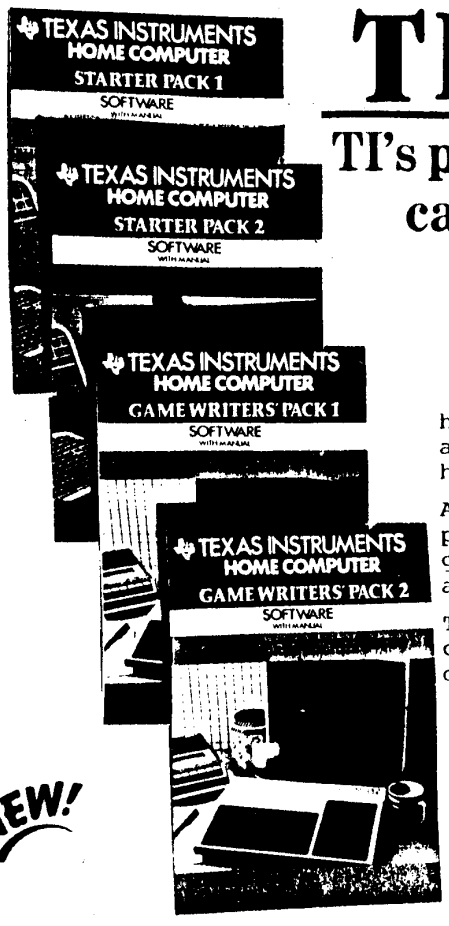

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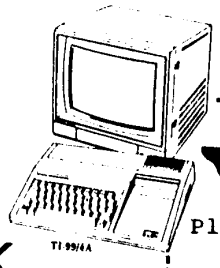

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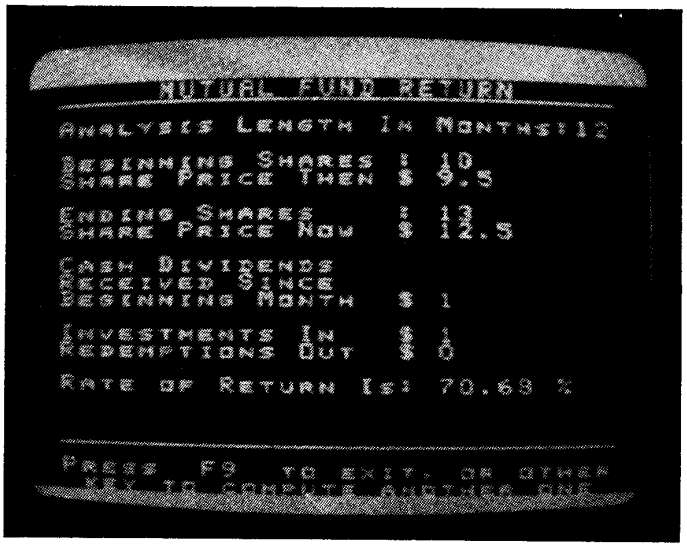
Extended BASIC program simplifies computation of return on mutual funds

By BILL GASKILL

While there seems to be any number of 99/4A programs around for checkbook management, loan amortizations, mortgage projections or savings goals, few seem to be available for use in managing investment type information. I have seen a couple of nice programs for the stock market investor, but a more timely program today is one that deals with mutual funds. Kent Thompson has authored the best one that I have seen, called Mutual Fund Manager. It is a complete package that allows the user to store a data base of information on particular funds. It is available for about $15 I believe from: Real Estate Projections, 409 Elberon Ave. No. 2, San Pedro, Ca. 90731.

If you are serious about mutual funds than this is the program to buy.



Mutual funds are perhaps the fastest growing investment vehicle today. The reason for their popularity is the fact that they allow individual investors to put relatively small amounts of money into a pool of funds that is professionally managed, with little or no fees or commissions, compared to the alternative of investing through individual investment advisors or brokers. While I am not going to go into the intricacies and strategies of mutual fund investing, I will explain how one can get started with this comparatively new investment vehicle, and how one who owns shares or units in a fund can determine the rate of return on their investment. The Mutual Fund Performance program that follows this article can be keyed in and run with only 16K and Extended BASIC.

There are hundreds of mutual funds to choose from and they come in various "shapes and sizes," meaning their ranks span the risk scale from low-risk, conservatively managed funds, to high-risk, very aggressive funds; and the investment goals scale from Money Market Funds to the quicker yield sector funds. Which one(s) you decide to put your money into is usually based upon the level of risk you are willing to accept, your investment goals and the track record of the fund.

RISK LEVEL

The amount of risk you are willing to take is something you should determine before diving into mutual funds or any other investment vehicle. To determine your risk level you should consider:

1—How long you are willing (or able) to leave the investment tied up.

2—How devastating the total loss of your investment would be to your personal finances and to your family?

3—Whether you are investing for long-term growth or whether you need the investment return for income?

4—How much money you have to invest.

5—How much time (or willingness) you have to devote to managing your portfolio.

INVESTMENT GOALS

Your investment goals play a big part in how much money you will gain or lose on your investments and most often how quickly the gains or losses will occur. The theory is, if you are willing to take big risks (at losing your money) then you should realize big returns for taking that risk. Thus, if you are a risk taker, your investment portfolio would be heavily weighted towards *growth*, and *income* type mutual funds. This is because these funds are geared towards maximum profit in minimum time. Your investment goals are what you hope to accomplish by investing your money with a mutual fund rather than sticking with that passbook savings or Christmas Club account you may have used in the past.

CHOOSING FUNDS

If you have the resources and the patience, you can track a particular fund's performance by reading the stock market pages in your Sunday newspaper. Sunday papers are used because they usually have the most complete and accurate quotes for the previous week. Since the market closes at 5 p.m. Friday, there is a whole day for the newspaper folks to get the information.

Tracking performance is a demanding task, but one that many investors use. It also has the disadvantage of not being able to tell you what the fund has done in the past. Past performance information can be had from the fund's prospectus (if you want to trust it) or one of the "money" type magazines.

Another method, which is a little more costly — but probably less risky, and certainly less demanding — is to subscribe to a reputable mutual fund investment newsletter. How you determine what "reputable" is, I will leave to you.

These newsletters are usually written by an "expert" or group of experts in the field of mutual fund investing. Most often they employ a forecasting model that uses virtually the same method for determining fund recommendations that you would use if you read the Sunday newspapers for a consecutive time period, past history (performance). However, they also consider many other variables that you and I might overlook or do not have access to such as ecomomic indicators, political climate, world prices, etc

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Most newsletters create model portfolios that you may follow (emulate) in your investments. The models are based upon high, moderate and conservative investment risks. The higher the risk the higher the return. In investment jargon, high risk funds would be called "aggressive funds." That means that the fund managers usually look for common stock investments in "un-favored" companies that they believe are going to blossom. So the fund buys low and then sells high when the stock goes up.

The newsletter is also a good place to begin your adventure into mutual funds since they list the names and often the descriptions of various funds that you might consider. Many newsletters also list the toll-free telephone numbers of the funds so that you may call and order a prospectus.

STARTING OUT

Assuming that you have some method of determining which funds to invest in, the first thing to do is find out how to get in contact with the fund administrators. Virtually all mutual funds have toll-free numbers for use in requesting a prospectus. The obvious place to look for these numbers is NOT in the yellow pages as one might think, but rather in the trade publications or in the newsletter of a friend who is already involved with mutual fund investing. Once you have the telephone number and are ready to make the call, be prepared to request information on specific funds (by the fund's name). Most mutual funds are "families" of funds. This means that there are several different funds under one administrator. This is necessary to meet the varying demands of the investing public and to optimize the use of investor dollars by having a broad range of investment types. Not everyone has the same investment goals, nor is everyone willing or able to assume the same level of investment risk.

If you don't know the name of the fund you are interested in, since newspapers provide only cryptic abbreviations for them when they are published, ask for help from the person you talk to on the toll-free line. Don't be afraid to be a little humble and admit your novice status. A good mutual fund employee will ask you what your investment goals are or perhaps ask whether you would categorize yourself as a conservative, moderate or aggressive investor. Either way, they are trying to determine what type of fund you might be interested in, based upon your investment goals.

Once you receive the fund's prospectus (it's free), you can try to read it from cover-to-cover if you want to. Some are quite easy to read, some are like an accountant's nightmare and others are between the two extremes. No matter which type you receive, all will contain certain information that you should look for, since it directly affects you and the money you will be investing. The list that I am going to give you is based upon my concerns. Yours may be different or more demanding, so don't feel that I have listed all the questions you should be asking. However, at a minimum, I think you should look for the answers to the following questions:

Don't be afraid to to be a little humble and admit your novice status. A good mutual fund employee will ask you what your investment goals are or perhaps ask whether you would categorize yourself as a conservative, moderate or aggressive investor.

1—How much (if anything) does the fund charge to join (the entry fee) and do they charge you to buy shares or units? In other words, is it a *load* or *no-load* fund?

2—Is there an minimum time you must keep your money in the fund without paying a withdrawal penalty (an exit fee)?

3—What are the administrative costs? No fund operates for free. You pay someone to manage your money for you.

4—What are the redemption procedures and what kind of a hassle is it to sell out?

5—Do they require a minimum dollar amount investment?

6—Do they offer telephone redemption and/or telephone switching between funds in the same family? How many times per year?

7—What kind of reporting procedure do they have for shareholders and how often is it provided?

While all funds assess a management fee, many today do not require a sign-up fee. In other words, they are no-load funds. Some funds however have a "hidden" load, one that is assessed when you try to sell your shares. This is an *end-load* fund, as opposed to a *front-load*. Front-Load funds charge you to get in. End-Load funds charge you to get out, especially if you do so in the first five years. Read the prospectus carefully to determine which type you are considering.

A very important consideration in your decision-making process is the amount or percentage of the fund's administrative fees. Most funds, whether they are load or no-load types, assess a "hidden" cost to you, in addition to regular administrative costs, that the fund uses to pay for advertising and marketing. You pay for this because the law, under Securities and Exchange Commission regulation 12b-1 allows it. There isn't much you can do about it, but you can mitigate it by choosing the fund that has the lowest administrative costs otherwise.

An important part of the investment game is knowing when to dump your shares, when to sell out. Because you don't want to lose money, timing is critical. Thus, the fund that you are investigating should have telephone switching or roll-over privileges. This means that it should offer (and support) the ability to sell your shares in one fund, and either redeem them or roll them over into another fund, by placing a telephone call. If the fund provides for this only by mail, you must realize that you will still be on a sinking ship for the number of days it takes your letter to get to the fund administrator's office. Normally, you should be able to make a phone call, communicate your "sell or roll-over" order and then follow that up with a letter confirming the order. The important thing is for you to realize the impact on your money because of the difference in procedures. Time is literally money in these cases.

CALCULATING YOUR RETURN

Assuming that you do take the plunge and invest in a mutual funds, you will want to monitor the performance of the fund so

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MUTUAL FUNDS—

(Continued from Page 25)

that you can determine whether you are making any money.

The Mutual Fund Return program is aimed at doing that for you.

At the first prompt you will be asked for the:

Analysis Length In Months: Enter a number from 1 to 24. This figure is used to determine the number of months involved in the analysis and to calculate an annualized return. If the current month is January 1987 and you bought into the fund in December 1985, you would enter the number 14, which is the number of months between December 1985 and January 1987 inclusive. You would count January 1987 as one of the months, even if the date you perform the analysis on is only the first day of the month.

Beginning Shares: This is the number of shares that were credited to your account on the month that this analysis begins. If you are measuring performance from the first month you bought into the fund, make sure that the figure entered here is the one provided on your statement after any entry fees are deducted. This (and all remaining) information should be included on the statements that you receive from the manager(s) of the fund. Also, note that some funds use the term "units" instead of shares. They are the same thing.

Share Price Then: This prompt asks for the price per share paid, on the month that the analysis begins. This amount should also be on your statement. It is the actual dollar figure cost of each share purchased.

Ending Shares, Share Price Now: The next two prompts ask for the ending figures of the same type of information asked above. Only these amounts pertain to the ending month of the analysis rather than the beginning month.

Cash Dividends: Enter the dollar amount of any dividends or capital-gains distributions that were paid to you during the analysis period. Do not include any money that was re-invested. Enter a zero if no distributions were paid.

The next two prompts ask for:

Investments In $: Enter the dollar amount of additional monies pumped into the fund since the beginning month of the analysis.

Redemptions Out $: Enter the dollar amount of any monies taken out in the form of redemptions. Enter zeros in both blocks if neither apply to the period of the analysis.

Once these figures are entered the program calculates an annualized return that is displayed as a percentage gain or loss.

Mutual fund return

```
100 @=1 :: CALL CHAR(96,"0
F"):: DISPLAY AT(2,@)ERASE A
LL:RPT$(" ",28):: DISPLAY AT
(22,@):RPT$(" ",28)!0130
110 IMAGE ##.## % !113
120 ON WARNING NEXT :: DISPL
AY AT(@,6):"MUTUAL FUND RETU
RN" !253
130 FOR G=0 TO 14 :: CALL CO
LOR(G,16,5):: NEXT G !125
140 DISPLAY AT(3,@):"Analysi
s length in Months:" :: ACCE
PT AT(3,27):AL :: IF AL<1 OR
 AL>24 THEN 140 !035
150 DISPLAY AT(5,@):"Beginni
ng Shares :":"Share Price Th
en $" :: ACCEPT AT(5,20):BS
:: ACCEPT AT(6,20):SP :: BE=
BS*SP !159
160 DISPLAY AT(8,@):"Ending
Shares :":"Share Price No
w $" :: ACCEPT AT(8,20)SIZE
(7):ES :: ACCEPT AT(9,20):SP
N :: CI=ES*SPN !140
170 DISPLAY AT(11,@):"Cash D
ividends":"Received Since":"
Beginning Month $" :: ACCEP
T AT(13,20):CD !0025
180 DISPLAY AT(15,@):"Invest
ments In $":"Redemptions O
ut $" :: ACCEPT AT(15,20):I
I :: ACCEPT AT(16,20):RO ::
RI=II-RO :: RI=RI*.50 !168
190 SA=BI+RI :: SB (CI+CD)-R
I :: SC=SB/SA :: SD (SC-1)*1
00 !0036
200 SE=12/AL :: SF=(SE*SD)*1
00 :: !173
210 DISPLAY AT(18,@):"Rate o
f Return Is:" !234
220 DISPLAY AT(18,20):USING
110:SF/100 !0038
230 DISPLAY AT(23,@):"Press
 F9 to exit, or other key t
o compute another one" :: CA
LL KEY(3,K,F):: IF F=0 THEN
230 !151
240 IF K=15 THEN 250 ELSE RU
N !0084
250 CALL CLEAR :: PRINT "Pre
cise rate is:";SF/100 :: STO
P !0027
260 DISPLAY AT(18,20):USING
110:SF/100 !0038
```

BASIC—

(Continued From Page 12)

```
520 IF NBB>0 THEN BB=NBB ::
GOTO 540 !194
530 PAY=BB+TT :: PRIN=BB ::
BB=0 :: FLAG=NM !0068
540 PRINT #1,USING 160:M,PAY
,TT,PRIN,BB !185
550 IF FLAG=NM THEN M=NM !07
7
560 NEXT M !227
570 IF BB=0 THEN 620 !166
580 CALL CLEAR !200
590 PRINT "PRESENT BALANCE D
UE:" !214
600 PRINT USING "$ #######.##
":BB !0030
610 NM=M :: GOTO 300 !213
620 CLOSE #1 !151
630 CALL CLEAR !200
640 END !139
```

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Modem Reference serves as guide

Brady Books/Simon & Schuster has published *The Modem Reference* by Michael A. Banks.

The book, which sells for $19.95, is described as the most up-to-date reference on online services (networks), available hardware and software and how computer communications work. The author says he wrote it for "both novice and hacker," as a guide to modems, communications software and online services.

Disk drivin'

Tips on shunt packs, cables and drive select lines

The following article refers specifically to Shugart-type drives (originally used by TI), with comments on TEAC-type drives. Most of the information should be applicable to all drives.—Ed.

By LARRY R. THOMPSON SR.

Connecting disk drives to a TI99/4A is a fairly simply item. You have basically three things to worry about:

1. Cable connections.
2. Setting up shunt packs.
3. Termination resistor packs.

CABLE CONNECTIONS AND DRIVE SELECT LINES

One area that TI seemed to do things right was in using standard interfaces for peripherals. Sometimes you have to rearrange pinouts to get equipment to work, but it will work.

However, on disk drives, you don't even have to worry about pinouts because TI conforms to the default industry standard. Fig. 1 shows the pinout for disk drives and the disk drive controller card. Since the original TI controller card did not support four drives, pin 6 of the card ws not used. With the exception of pins 10, 12, 14 (and 6), all the lines go to all the drives connected to the system. Lines 10, 12, 14 and 6 are the drive select lines.

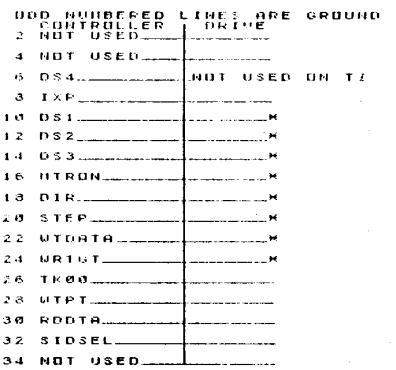

Fig. 1

Figure 2 shows how the normal Shugart drives are connected at the factory. If all the drive select lines are connected to the drive and nothing is done to the shunt pack, any one of the drive select lines going low will cause the drive to be activated.

There are a number of way to go about setting up the drives so that only the appropriate drive is activated. One method is to make up your cables with all pins connected then punch the shunt pack as shown in Fig. 3. You'll notice that DS2 and DS3 are punched out. The drive would then respond as DSK2.

Another method is the one TI used. To make hooking up the drives as simple as possible for the owner, all drives were punched as DSK1. Then, when additional

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DISK DRIVES—

(Continued from Page 27)

drives were connected, they were connected using the small circuit card that came with the controller card. All the circuit card did was to connect line 12 from the controller card to line 10 on the second drive, and if a third drive was used line 14 (which was line 12 going to the second drive) was connected to line 10 on the third drive (see Fig. 4).

Radio Shack also made it simple to connect drives. But instead of using the jumper card, they removed pins from the connector plugs, such that pins 10 and 14 were not connected to the second drive, and pins 10 and 12 were not connected to the third drive. Using this method the owner did not have to worry about the shunt pack, because the cable did the drive selection.

This method caused me a small amount of grief. When I first installed my double-sided drives I had trouble trying to get them to work. As it turned out, I was using a Radio Shack cable. For some reason, Radio Shack also pulled the pin out of line 32, which is the side select line. So I could never access side 2.

TEAC-type drives don't have a shunt pack. Instead they come with a jumper which you have to move to the appropriate drive select line. Fig. 5 shows the jumper set up for DSK2.

When installing your own drives, you have to insure that only the appropriate lines are connected. If you have the TI drives, but you don't have the circuit connectors, you could remove the shunt pack and try to restore the straps that have been punched by pushing them back out and soldering them. Or, remove the shunt pack altogether and install a DIP switch and set the switches according to how the lines should be connected.

Whatever you do, if you are going to install your drives yourself, take the time to examine the drive carefully. Even Shugart drives that appear identical to the TI units can have different configurations. For example, I bought a Radio Shack drive that did not have the shunt packs. To set the drive for DSK1, 2 or 3 you would have to cut a circuit trace on the drive, in which case you would be better off using their cables or making your own cables and remove the appropriate pins from the connecting plugs.

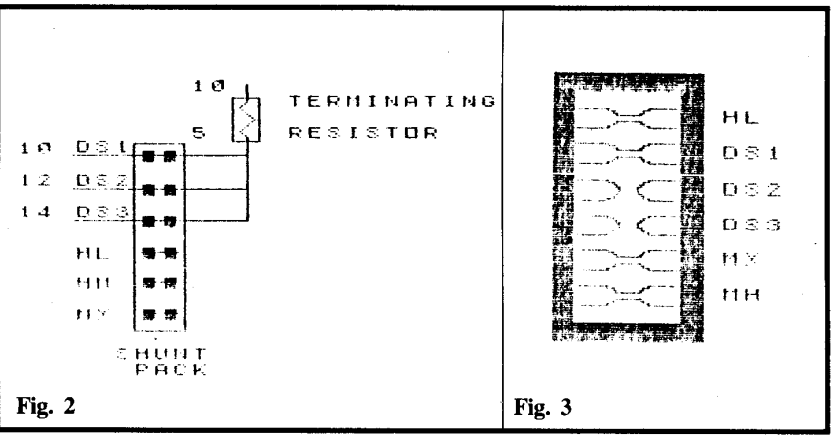

Fig. 2

Fig. 3

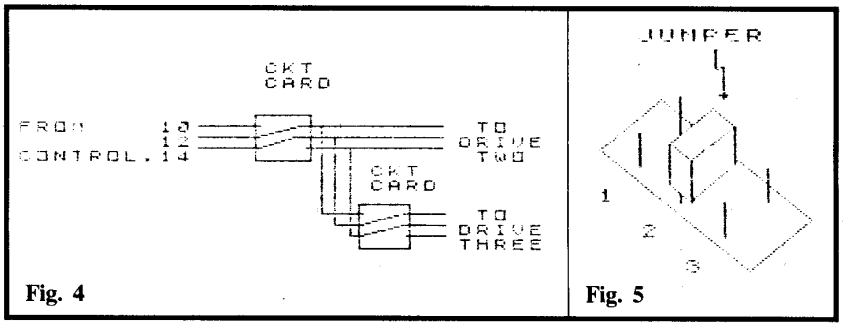

Fig. 4

Fig. 5

TERMINATION RESISTOR PACKS

Five of the lines going to the controller (shown with an asterisk in Fig. 1), in addition to the drive select lines, must have a termination resistor installed in the end of the line. If you have one drive it would be in DSK1, if three drives in DSK3.

A drives come with the termination resistors installed. When installing your additional drives you have to remove the resistor packs from all but the last drive in the line. However, this creates another problem. Referring to Fig. 2 again, you can see that one termination resistor is used for all three drive select lines. If you remove the termination resistor pack from DSK1 or DSK2 then line 10 or 12 would not have a termination resistor. To get around this you have to install a 150 ohm resistor from pin 5 to any of the pins on the opposite side of the IC socket the resistor pack came out of (the exact location may be different for other than Shugart-type drives).

If you don't remove the resistor pack the drive will still work, but you could wind up damaging your controller card. With two drives this may take a while, and with three drives I would imagine it would be fairly quick.

As with anything, there are exceptions. When I picked up my present TEAC drives the dealer told me that I didn't have to worry about the resistor pack. For one thing, the resistors were not socketed, so I would have had to cut the resistors off the board.

When I got the units home I checked to see what value resistors were used, and it turned out that where Shugart drives use 150 ohm resistors, the TEAC drives used 500 ohm resistors. Four TEAC drives would have about as much effect on the controller card as one Shugart drive. If you are going to use drives other than Shugart and TEAC types, check with the seller on how they have to be set up. In any case, if the resistor packs are socketed, remove them. If not, check to see what resistance value is used, and insure that the resistance seen by the controller card is no less than 125 ohms.

SHUNT PACKS

I have already covered the shunt pack as regards the drive select lines. The remainder of this article will be concerned

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DISK DRIVES—

(Continued from Page 28)

with the remaining three lines. It should be noted that this information is specifically for the Shugart-type drives, although it should be similar for other types. In some cases you will find that these additional shunts are not provided.

Fig. 6 shows the basic logic used by the drive selection circuitry and how the shunt pack fits in this logic. Although not shown, line 16 also feeds additional circuitry.

The remaining shunts are labled MX, HL and HM(MH).

HL shorted (connected) causes the head to load whenever the drive select line is taken low. This line should always be set up opposite of HM.

HM shorted causes the head toload whenever themotor on line is taken low.

MX shorted causes the drive output enable to be active all the time.

The sfest way to set up the shunts is to have HL shorted and HM and MX cut. This will work regardless of how many drives you have connected. If you have drives without the additional shunts thisis the way the drive would be configured.

If you are using a single drive system, you may see a slight speed improvement if you set up the drive with HM and MX shorted and HL open.

CONNECTING CABLES

After you've gone through your drives and decided how to set up your cables you have two options:

1. Have your cables made up
2. Make the cables yourself.

If you have your cables made, tell your local dealer how you want your cables configured so he can make them for you. If you decide to set up your drive select lines by punching the shunts, you can use standard PC cables for your internal and external drives, otherwise you will need to tell the dealer which pins you want removed from the connectors. Also, for your power connector you will need an IBM-type power splitter which consists of a four-line Molex male to two Molex female connectors.

If you make your own cables, you will need the following parts:

- 34-conductor flat ribbon cable
- 34-conductor edge card connector for each drive
- 34-conductor edge card connector for external drives
- 34-pin socket connector for internal drives.

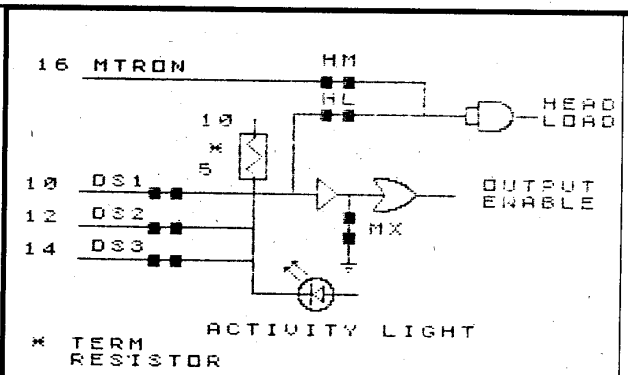

Fig. 6

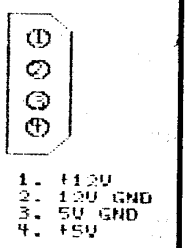

Fig. 7

One conductor of the cable will normally be a different color than the others, to help keep track of which conductor is which, and the card side of the edge card connector will have the pin numbers imprinted on it. The 34-pin socket connector does not normally have the numbers on it but an arrow or indent will normally indicate which is pin 1.

To the cables, the colored conductor should be used as line 1. Insure that all of the connectors you use have the colored conductor in the pin 1 position and press the cable in to the pins on the connector. If you are setting up for multiple drives, install the edge card connectors in the appropriate location in the center section of the cable. Try to keep the length of the cable as short as possible. Longer cables may make locating your drives more convenient, but it could also cause noise pickup on the cable which could interfere with drive operation. Shugart recommends a maximum of 10-foot length for the signal cable, but you're less likely to have problems if you keep your cables as short as possible.

When you connect your cables to the drives you have a 50-50 chance of hooking up the cables backwards. If this happens, as soon as the unit is turned on the drive light on each drive will come on and the motors will spin. If you have more than one drive and they all come on simultaneously, reverse the connector on the controller card. If only one drive light comes on, reverse the cable for that drive. If you have only one drive, you may reverse either end.

After the drives are connected, enter BASIC and without using a disk try to read from each drive by typing OLD DSKX.TEST, where "X" is the drive number to read from. If the cables are properly configured, only the light for the selected drive will light. If more than one light comes on, you forgot to punch the shunt or remove the pin from the edge card connector. If no light comes on, you either punch the wrong shunt or removed the wrong pin, depending on how you decided to connect your drives.

Warning: If you are using an external drive which is the one with the terminating resistor pack installed, this drive MUST be powered up any time you are using any of the drives. The drive with the terminal resistor pack provides power to the various control lines coming off the controller card. If the drive with the terminating resistor pack is not powered up you can force you rother drives into the write mode even if your disk is write protected, normally resulting in the destruction of data on track 0, which can result in the loss of all data on the disk. I managed to do this on several disks until I realized what was causing it.

SUMMARY

If you are going to set up your own drives, take the time to examine your drives to see exactly how they are set up. Insure that only one drive select line is terminated on a drive by either punching the shunt straps, installing a jumper to the appropriate drive select line, or removing the pins from the connecting cable connector. All other lines should be connected 1 to 1, 2 to 2, etc.

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MICROpendium Index

This will get you through 1987

This is the fifth installment of Elton Schooling's BASIC index of MICROpendium. Other installments were published in the April, June, October and November 1988 editions. Readers who use this index must have the above editions available.

The index data for 1987 starts at line 390, with the program preceding it. The program to run the index was published in the June 1988 issue and should be merged at the top of the data statements for each year's index.

Readers who discover errors in the data statements are encouraged to provide corrections so that we may pass them along to others.

1987 Index

```
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ODES USNO 4/87/45,PHONEANSW
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590 DATA BASMATH 5/87/10,USG
RPCAT 5/87/16,FORTHTI 5/87/2
4,XBASLOAD 5/87/26,ENGLAND R
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A REV 5/87/28,BOOK TECHNICAL
DR REV 5/87/31,RAMFAST MEM U
```

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DISK DRIVES—

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Unless you have the new TEAC-type drives with the high resistance terminating resistor packs, insure that all the drives except the last one have the terminating resistor packs removed. On any drive in which the terminating resistor pack has been removed, insure that you have a 150 ohm resistor installed for the drive select lines.

One final note: If you have a CorComp or Myarc disk controller, check the head-step settings on the card. If the head-step setting is too fast, your drive may work erratically or not at all. If the head-step setting is too slow the drive will appear noisy when stepping, also causing excessive wear on the drive. Don't be afraid to experiment to find the best setting for the head-step speed. MG's Advanced Diagnostics program allows you to set the head-step times under software control, which you can use to check out the various head-step times without removing and installing the drive controller, a feature that by itself makes the program worthwhile to have.

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630 DATA VARPRNTOUT USNO 5/8
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640 DATA PROOF 6/87/14,CNTRL
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660 DATA 4ADOS DSKUTIL 6/87/
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670 DATA MYARC RAMDSK FUNLWR
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680 DATA COOLCONS FAN USNO 6
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690 DATA QUILTBAS 7/87/10,FO
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700 DATA TIBBS 7/87/25,USGRP
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ANJR GA REV 7/87/28,AVATEX12
00 MODEM REV 7/87/30,BUBBLEP
LANE GA REV 7/87/31 !109
710 DATA GENEVETOMON 7/87/34
,TIART 7/87/35,DM1000 USNO 7
/87/35,STOPIT GA USNO 7/87/3
6,VDUTIL USNO 7/87/36,CTRLU
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720 DATA TIART ROTATE USNO 7
/87/35,FANVSPOWSUPP 7/87/36,
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730 DATA CHAR SHIFTER USNO 7
/87/37,ENV IDENTIFY USNO 7/8
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740 DATA SURGE FEEDB 8/87/10
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750 DATA GENEVE 8/87/33,TIFO
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760 DATA FORTHTI COPY 8/87/3
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770 DATA USGRP 8/87/42,GENEV
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8/87/45,ZEROSLASH 8/87/45,KE
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790 DATA GENEVEFIX FEEDB 9/8
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870 DATA FUNNELWEB CUSTOMIZE
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890 DATA DSKLABEL USNO 10/87
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960 DATA EDGECHAR USE USNO 1
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970 DATA PRINTER NLQFONT USN
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976 DATA GENEVE MY-ART REV 1
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980 SUB LONGSHELL(N,N$()) !10
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990 D=N !080
1000 D=INT(D/3)+1 :: FOR I=1
 TO N-D :: IF N$(I)<=N$(I+D)
THEN 1030 :: T$=N$(I+D):: J=
I !036
1010 N$(J+D)=N$(J):: J=J-D :
: IF J<1 THEN 1020 :: IF T$<
N$(J)THEN 1010 !068
1020 N$(J+D)=T$ !100
1030 NEXT I !223
1040 IF D>1 THEN 1000 !230
1050 SUBEND !168
```

Modifying character patterns

Don't like what the keyboard produces, create your own

By DAVID ERICKSON

Recently we have had three User Notes on slashing the zero in Multiplan. This led me to wonder about changing the screen representations of any of the characters. Armed with MG's Advanced Diagnostics (any sector editor can be used), I set out to find what was going on in Multiplan file MPCHAR and TI-Writer file CHARA1. Here's what I found:

First, we'll assume a working knowledge of the CALL CHAR subprogram from Extended BASIC and start with TI-Writer file CHARA1. The character design is made exactly as in the CALL CHAR subprogram with 16 hexadecimal digits giving the pattern. However, the two rightmost bits of each row are ignored, so you can have these bits on or off — it doesn't matter except on the Title and Formatter screens. This allows for a narrower character and therefore more (40) columns on the screen. To find where in this eight-sector file your new pattern should be placed, use the following formulas:

relative sector = INT(ASCII/32)
*start byte =(ASCII)*8-6(relative sector) *256*

where the first byte of the sector is byte zero, and ASCII is the decimal ASCII code of the redesigned character. Using your sector editor, find the first sector for file CHARA1: this will be relative sector zero, your basis for locating the other sectors of the file. Thus the NULL character (0, >00) starts at byte 6 of the file's first sector and has a pattern of:

0020 0000 1824 2418

The last character of the file is the DEL character (127, >7F) starting at byte 254 of the fourth sector and ending at byte 5 of the fifth sector. The rest of the sectors are hexadecimal zeroes and don't seem to represent anything. Write your new pattern(s) back to the diskette for use later (you are using a scratch copy of TI-Writer, aren't you?).

This now allows me to match my daisy wheel printer's fractions one-half and one-fourth with screen representations for them instead of the vertical bar (124, >7C) and the left brace (123, >7B). This method would also allow for other alphabets and symbols to be used on the screen with TI-Writer. Several versions of TI-Writer could be generated, and then used according to the particular need that arises. Of course, you can still use it to slash your zeroes or just slightly modify an existing letter or symbol.

Incidentally, the cursor will initialize with the character pattern for ASCII 30 in the CHARA1 file. However, it will be reset to the usual rectangle when going to fixed mode and then back to word wrap.

The next thing to be done is to paste a label on the corresponding key cap on your keyboard to remind you of the change you made.

Even though you have changed the screen representation and the key cap label, your dot-matrix printer will still think that an ASCII 65 is an "A." There are several ways to fix this, depending on the printer

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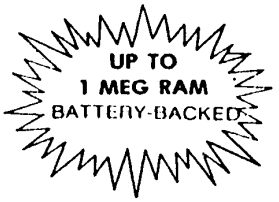

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CHARACTER PATTERN—

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that you have.

If your printer accepts download replacement patterns, this can be done before entering TI-Writer through a short BASIC program. Using the Special Characters Mode, the download patterns could be sent from TI-Writer by printing from the Editor (PF) or through the Formatter. A file could be created and stored on disk and printed through the Editor each time that the different character set is desired. Also using the Formatter, you could use Jack Sughrue's (PLUS!) method for TransLiteration (.TL) to put your printer in graphics mode and then send the graphics code for your redesigned letter or symbol.

Now you can write newsletter articles on bridge, for instance, and be able to use symbols for the card suits all the way from the keyboard through the screen and to the printer.

MULTIPLAN

What about Multiplan? The screen character patterns in the file MPCHAR are generated in the same way as in file CHARA1 for TI-Writer.

Again use your sector editor to find the beginning of the eight-sector file MPCHAR on your diskette. The characters defined and usable in Multiplan are ASCII 32 through 127. The definitions start in relative sector one of the file with the SPACE (32, >20) at byte 0. Use the following formulas to find the character you would like to change:

relative sector = INT(ASCII/32)
start byte = ASCII*8-(relative sector)*256

where ASCII is the decimal code for the character (32-127 only), and byte zero is the first byte of a sector. The inverse video screen representation for a character under the cursor is given exactly four sectors after its standard version. To develop this pattern, turn the "on" bits off and the "off" bits on. Again the two rightmost bits in each row do not matter.

Again the key caps can be labeled to show their new symbols.

Changing the printing pattern in your dot-matrix printer needs to be done with a short BASIC program before entering Multiplan because of the difficulty in getting printer control characters into a Multiplan spreadsheet. (Refer to a September, 1985 MICROpendium User Note if this is desired.)

You now have the ability to modify TI-Writer and Multiplan character screen representations to better suit your needs.

```
                Edit Sector          EDIT
=========================================
4C50 101C 1010 0000 0000 0000 0000 1010
1010 1000 1000 2828 2800 0000 0000 2828
7C28 7C28 2800 3854 5038 1454 3800 6064
0810 204C 0C00 2050 5020 5448 3400 0808
1000 0000 0000 0810 2020 2010 0800 2010
0808 0810 2000 0028 107C 1028 0000 0010
107C 1010 0000 0000 0000 3010 2000 0000
007C 0000 0000 0000 0000 0030 3000 0004
0810 2040 0000 3844 4444 4444 3800 1030
1010 1010 3800 3844 0408 1020 7C00 3844
0418 0444 3800 0818 2848 7C08 0800 7C40
7804 0444 3800 1820 4078 4444 3800 7C04
0810 2020 2000 3844 4438 4444 3800 3844
443C 0408 3000 0030 3000 3030 0000 0030
3000 3010 2000 0810 2040 2010 0800 0000
7C00 7C00 0000 2010 0804 0810 2000 3844
```

Sector from TI-Writer CHARA1 file

Geneve

Autoexec and memory usage explained

By MIKE DODD

It seems that, despite all the articles and files concerning it that have appeared on networks, many users are still unclear on how to set up an AUTOEXEC file. Perhaps the files have not filtered down to many users. It is a sad but true fact that to get maximum usage out of the Geneve, belonging to a network such as Delphi or GEnie is very helpful. Since the print media and users' group activity appear to be on the decline, the networks are getting stronger by the day.

This tutorial will assume that you are using MDOS V1.06 or higher (up to and including MDOS 1.14, and possibly beyond).

A typical AUTOEXEC file for a barebones user might be:

```
TIMODE
RAMDISK 120
ASSIGN E=DSK5:
GPL DSK1."E/A"
```

This AUTOEXEC file will set up an internal RAMdisk and enter GPL mode with the Editor/Assembler cartridge loaded.

Line 1 initializes the Geneve computer for using GPL. This command MUST be on the first line. Ommision of this command will prohibit loading GPL. The TIMODE command sets aside various memory required for GPL.

Line 2 sets up a 120K (480 sector) RAMdisk. The RAMdisk will be accessed as DSK5. This is the largest size RAMdisk that you can use with the TIMODE command.

Line 3 instructs the computer to direct drive E: to DSK5. Any access to drive E: (e.g. DIR E:) will now operate on DSK5, the internal RAMdisk.

Line 4 loads the GPL interpreter and forces it to load the cartridge file DSK1.E/A. The quote marks are required, as there is a slash in the filename. If you wanted to be able to randomly select a cartridge to load without a default, you would eliminate the DSK1."E/A" from the line.

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Geneve

(Continued from Page 34)

You will notice that there is no SPOOL command in the AUTOEXEC file. MDOS automatically sets up a 16K print spooler. If you wish to have a larger one (16K is the minimum size for the spooler), you may include a SPOOL ## command, where ## is the number of K you wish allocated for it. Keep in mind that if you do so, the maximum size for the RAMdisk is similarly changed.

Some users, however, have Horizon RAMdisk(s) or extra memory. In that case, another AUTOEXEC file should be used. For example, assume a system with two floppy drives, one Horizon RAMdisk, sitting at CRU base >1400, and an extra 32K of static RAM. Also assume that the HRD contains the XB cartridge and the GPL interpreter, which you wish loaded as a default. You might set up your AUTOEXEC file as follows:

```
TIMODE
RAMDISK 152
ASSIGN C=DSK5:
ASSIGN D=DSK6:
D:GPL D:XB
```

The RAMDISK command takes advantage of the greater memory size. The ASSIGN commands set drive C: to be in the internal RAMdisk and drive D: to be the Horizon RAMdisk. GPL is then loaded from the HRD, loading XB with it.

MEMORY CONSIDERATIONS

The Geneve, as shipped, contains 544K of CPU memory. This is in the form of 512K of standard CPU RAM and 32K of no-wait-state RAM.

MDOS booted without an AUTOEXEC file takes up 152K of memory, 16K of which is for the print spooler.

The TIMODE command takes up 208K of memory.

In the first AUTOEXEC file presented above, we had the above memory requirements plus an additional 120K RAMdisk. 152 - 208 - 120 = 480K of memory used. Subtract that from the 544K of RAM on the Geneve, and you have 64K of free memory. This is the minimum required for loading GPL and many other public domain and fairware MDOS programs (the Linker program and HyperCopy programs are two that require more memory).

Another consideration is the architecture of the Geneve. The Geneve is designed to use memory in 8K blocks. Because of this, to gain optimum use of memory, the print spooler and RAMdisk sizes should be evenly divisible by 8K. A 57K RAMdisk would take as much memory as a 64K one would, but it doesn't allow as much storage. The latter takes the same amount of memory, and gives the user an extra 7K of storage.

OTHER NEWS

John Johnson has written a program to utilize the mouse in GPL mode. Called RAT, it patches the key scan routine so as to allow cursor movement with the mouse. In addition, it allows usage of the three buttons to produce space, enter, and F9 key presses. Moving the mouse produces a cursor movement (with the up, left, right, and down arrows) in the appropriate direction. The program has been uploaded to GEnie and, in all probability, other BBSes and networks. Unfortunately, due to the low level way in which the program modifies the key scan, it will only work with V1.08 of MDOS. It will not work on previous or later versions. No doubt the program will be modified as further versions are released.

In last month's column, I neglected to mention the price of Picture Transfer. The price is $30, or, if you are one of the very few people to have made a fairware donation, $15. Genial Computerware has a list of the donors and will check it.

The first issue of Beery Miller's "9640 News" has been sent out. The publication is disk-based, and contains files relating to the 9640 (as such, it complements, not competes with, Barry Traver's excellent Genial TRAVelER diskazine, which has files primarily for the 99/4A). The first issue contained MDOS V1.14, an article on 80 columns from GPL (written by yours truly), a simple MDOS-mode database, a file containing news from around the 9640 world, and many other files. Miller says that a sample issue is $5 from within the US, $7 for foreign. Five issues is $25 for the US, $30 for foreign surface mail, and $38 for foreign air mail. Send to: Beery W. Miller, 5455 Marina Cove #1, Memphis, TN 38115.

READER TO READER

Norberto R. Bettinelli, Casilla de Correo 39, 1429 Buenos Aires, Argentina says he owns a Geneve and says he would like to use as double-sided/double density disk controller and RS232 those he has in a spare copy of a CC-9900 PEB.

"I tried locating my Geneve in the third slot instead of the first, and it worked as usual, loading the programs using the TI drive card and a couple of Teac drives," he writes.

"I then installed again the original card with the Flex cable, took away the TI drive card, connected th Flex cable to the right side of the CC-9900 PEB and the two drives to the proper port and powered everything. But the contraption didn't work. I tried removing the TMS4500 'chip' from the CC-9900 to unhook the CC-9900 PEB 32K expansion from the system, just in case it was perturbing, but to no avail.

"Would somebody suggest a way to save me plenty of bucks by using the CC-9900 PEB instead of spending some US $250 in a RS232 card and a DS/DD card?"

Kurt Radowisch asks whether anyone knows how to realize the SIZE-command from Extended BASIC while a program is running on the TI or whether there is a simple POKE-listing for a little assembler program to make visible the remaining stack memory when using XBASIC programs.

Radowisch, who sent along multilingual vehicle stickers reading, "I didn't vote for Waldheim!" says he would like to exchange letters or disks with TI users anywhere in the world. Write him at Fugbachgasse 18/13, A-1020 Vienna, Austria.

Roger Feinauer wants to know where he can find a program called 1000 Words which uses TI-Writer with TI-Artist picture files and whether there is a fix for the cartridge game Dig Dug for the Geneve. "I wish there were a list of addresses memory locations used in these programs a person could reference that would allow us novice users to compare with and change so we could fix and learn GPL programming," he writes. He is editor for the newsletter of the Oh-Mi-TI and New Horizon computer clubs of Toledo, Ohio, and would like to hear from anyone with any new information on the 9640 or the TI99/4A. Write him at 166 S. Mckenzie St., Adrian, MI 49221.

Myarc Q&A

Work to start on streamer tape software

Myarc Q&A is designed to answer questions about Myarc products. Answers are provided by Myarc spokesman Jack Riley. Readers may submit questions to MICROpendium for use in future columns. Send questions to MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

What about an external television synchronization input for the Geneve. Any "transparent" color on the screen would let the input video through. This is a simpler matter than a frame-grabber, which I hope will be available someday and would make it possible to use the computer to add lettering and graphics to a live picture.

All sorts of special hardware is possible, but the fact is that the Videoflex card does much of what he's talking about. Myarc doesn't have any hardware to do that with, but we did put the hooks in there so that third-party people can add it if they like.

Will the standard 32K card become redundant or do I need that installed if I am running both the TI and the 9640?

The memory expansion cards, whether they're the Myarc 512, the Foundation, the CorComp, the TI 32K — none of them can be in the Peripheral Expansion Box with the 9640. You can, however, modify the Myarc 512K to become part of program memory. In other words, instead of having 512K of program memory on a 9640 you would have a megabyte of memory. But because of the way the memory is done on a 32K card, that is not modifiable and is not required in the box.

What do the Sys/Req, ESCape and Break keys do?

First of all, the keyboard we used is essentially the same key layout as an IBM-PC, AT, PS2, etc. Therefore, some of the keys are marked the same. The System Required key is really your print screen key. System Required is what you would normally use with an additional keypress on an IBM. We currently don't use that multiple keypress. We do, however, use the print screen portion of the key to dump your screen. In other words, what you have on the screen while in DOS by pressing SHIFT Print Screen will dump it to whatever you've set your printer default to be. Normal default is PIO. The Pause key will pause the scrolling of the screen. For instance, if you're reading a DV/80 file with DOS to the screen, you press your Pause key and it will pause that scroll until you press another key. The Break key is the same thing as Control C on a TI. If you have instituted a command in DOS, let's say COPY A to B and press Control C or Break it will break or stop that command just like Break in BASIC or Extended BASIC on a TI. The ESCape key is used in different programs like MY-Art. It allows you to exit or escape MY-Art.

On consoles equipped with F11 and F12 keys, what do they do?

Currently they're not used for anything. In the future they will be used as special function keys. Now, the Scroll Lock key, which is a lit key on our keyboard, is used on an IBM to do an entirely different function than what we use it for. It will be used in Myarc Advanced BASIC to indicate which mode your function keys are in. With it off, the function keys will perform as they do on a 4A. In other words, F1 is delete character, etc. With the Scroll Lock key on (lit) it will do the special functions as shown in the Geneve manual (pages 16 and 19).

How is a character entered in MY-Word in the ASCII range 128-255? You can get them by transliteration, but I haven't figured out how to enter them directly.

I don't think it can be done. At that point in time you're emulating a 4A so you only have the displayable characters that the 4A had.

Why the change in the Attrib command from R to P?

Because "P" is more consistent with what this market is used to. P for protected.

When will software for the streamer tape backup be ready?

The schedule calls for everything to be ready to start putting code down the first of the year, expecting to take about month to code it. About the first of February we should have it ready to beta test and start the debugging stage. We'd expect that to take no more than a month. So, as we speak, we'd expect to have it done by the first of March.

Would that run out of MDM5?

It would run out of MDM5.

Would that work with a streamer tape drive or a video recorder?

A streamer tape only. It will be a special type and so forth, and we'll give you those specifications when its ready.

If you call a directory of the files on MDM5 (V1.28), you will see one file called CB, and you'll see another called DB. Well, the DB means Directory Backup and the CB means Complete Backup. And you'll also have one called SB, Streamer Backup, and that will be the file that will backup to a streamer tape.

Because EPROMs on the Hard and Floppy Disk Controller have been upgraded several times, how do users exchange their older EPROMs for newer ones?

It will be on an exchange basis only. Those 128K EPROMs are not inexpensive — they're $30 apiece — and it will really be at the customer's option how he wants to handle it. For instance, he can send us his EPROM. Once we receive it, we will send him another EPROM at no charge. That's assuming we receive his EPROM in good working condition. Or he can send us his card. We will install it and send it right back to him at no charge. If he wants us to send him an EPROM, we can send it to him COD. Once we receive his EPROM back in good condition we will re-

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SUPER EXTENDED BASIC OWNERS!
Have four modules in one with:
MULTI-MOD

The MULTI-MOD is a plug-in upgrade for owners of Triton's Super Extended BASIC module that gives you SEB, Editor/Assembler, Disk Manager III, and TI-Writer ALL IN THE SAME MODULE! It may be the only module you'll ever need!

The price of the upgrade kit is $22.95 and includes a manual and disk with the Editor/Assembler and TI-Writer support files. A free brochure is available on request from:

John Guion
11923 Quincy Lane
Dallas, TX 75230

Also ask about TI RS232 and Disk Controller upgrade kits.

(Super Extended BASIC is a trademark of Triton Products Company)

Telecommunications

Networks are cave-like adventure

By JOHN KOLOEN

I was going to get into surcharges with this installment about the major telecommunications services, but its like trying to keep up with the latest developments in the U.S. tax code. Surcharges can reflect anything from the actual costs that telephone companies charge the networks for use of their lines to so-called *value added services*, such as Dow-Jones stock market statistics. And, of course, the telephone companies are constantly trying to get Congress to enact legislation that would add bucks to the phone bills of hobbyists and others who use their phones for data transmission.

Instead of dealing with that, I'll dive directly into the data libraries supported by the TI-SIGs on The Source, GEnie, Delphi and CompuServe.

Data libraries are repositories of information. They are, in fact, libraries of data that are cross-referenced by keywords, date of entry and author's ID. Imagine going to a public library and being able to locate a book, or a list of books, based solely on indexing. You don't have to visually scan the stacks or hunt for titles. Instead, you enter a keyword, or author's name, and voila, every book that references that keyword or name is listed on a screen.

Armed with this list, you simply call up the item you are interested in and *download* it. No fuss, no muss.

In addition to searching for items by keywords and the like — a range of dates is possible on some networks — data libraries may be arranged by topic within a library. Thus, for example, a data library that concentrates on computer hardware may be broken down into a variety of hardware categories, such as disk drives, memory cards, modems, and the like. This facilitates searches for specific information. The finer you can tune your search definition, the quicker — not to mention cheaper — you can retrieve the information you are looking for.

Refer to the chart accompanying this article for a listing of the data libraries on the four networks. Note, too, that for each data library there may be dozens of subcategories or topics. Refer to the printout of a listing of programs available in for downloading from the boards. Notice how the programs are referenced with entry number, keywords, author's name and date.

Subcategories of data libraries are important because they help reduce the amount of time it takes to locate specific information and they are an indication of the primary interests of the SIG's members. It's not uncommon to see subcategories dedicated to specific products, such as the Myarc Hard & Floppy Disk Controller. Plenty of people are interested in it and this way *traffic* about the HFDC is directed to one place for quick and easy reference.

Often, new topics spring up around the latest software or hardware innovation. The topic will appear, usually started by an inspired user, and then there will be a flurry of contributions from other users and then interest will flag and few new items will be contributed. Even though the topic itself becomes moribund in terms of receiving new information from users, the information that it has will remain available until there's no room to store it, the Sysops clean house or until the business managers of the network decide it's no longer cost-effective to maintain large, insufficiently used databases.

I prefer a network whose SIGs provide a large variety of topics and categories that mirror its users' preferences. A responsive network will let its users define the contents of its SIGs. My view is simple — the more the merrier. So, in evaluating a network, I would like to see lots of topics, like specialty shopping centers that have a tobacconist shop for tobacco, a coffee shop for coffee products, a candy store for sweets, a toy store for toys, you get the idea.

Which of the networks has the largest number of categories? CompuServe, GEnie and Delphi have a continuously growing list of topics. Of the four, The Source is the only one that hasn't shown significant growth over the past year in terms of the number of topics it supports.

THERE'S NO FREE LUNCH

Gaining access to all this information comes at a price, and it's not uncommon for new users to spend hundreds of dollars during their first months on a board learning how to use it efficiently. (This doesn't include the cost of a modem or the initial

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TI-SIG data libraries by network*

CompuServe	Delphi	GEnie	The Source
General/Text	General	RoundTable Roundup	Users Groups
99 New Uploads	Trading Post	Telecommunications	BBS's
99 BASIC/XBASIC	Communications	Software Reviews & Tips	Walt's BCS Newsletter
99 C et al.	Games	Hardware Reviews & Tips	Assembly Language
99 Classics	Languages	BASICally Programs	Forth
99 Going, going...	News	Myarc Land	TI potpourri
99 Art/Music/Games	Geneve 9640	Languages Obscuras	Members Directory
99 Pascal/p-System	TI99/4A	Fairware Shop	Software Library
99 Forth	Mid-Atlantic UG	TI RoundTable Newsletter	
Geneve Info/Pgms	Graphics	Graphics	
GIF/RLE	Canada Communique	KRACKerbox programs	
TBA	User Group/BBS		

Listings include only libraries of significance to TI or Geneve users. TI Professional and administrative libraries are not included.

MYARC Q&A—

(Continued from Page 36)

fund his COD. Or we can put it on a credit card for him, and once he sends it back we will credit out the credit card. Whatever's best for him. Using UPS, it normally takes about a week from the time he sends it and we get it back to him. And he must send it to our Alabama office and call first to get an RMA number so that we can keep track of these things. (Myarc's Alabama phone number is 205-854-5843. The address is 2624 Ranier Dr. NE, Birmingham, AL 35215.)

The P-GRAM Card

Another way to dump cartridges

By HARRY BRASHEAR

GRAM loading devices... what are they? Perhaps I had better explain that before we get into this, but let's keep it simple.

There have been a couple of these devices circulating around the community for a while now. The most famous one, the GRAM-Kracker, came from Miller Graphics. Essentially, what they do is grab the contents of a cartridge, put it on a disk, and from there it can be loaded into a special RAM. This allows two things of importance to happen:

1. You can now "throw away" the cartridge and, 2. You can now make changes in the cartridge's contents because you can get to the RAM to manipulate the program.

Take, for instance, Extended BASIC. Soon after the GRAM-Kracker came out, various people began to redo and/or add to some of the routines in the XB program. The end result was the Miller designed Super Extended BASIC cartridge. All of the routines that are now in this cartridge were available on disk to add to Extended BASIC before SXB came out.

Here's another example. How about all those old cartridges that defaulted to the RS232 port for printing. Put them into a GRAM device and you can change the RS232 to PIO with no problem. Those two examples hit the closest to home for most people, but it doesn't even begin to tell what can be done with a little imagination. The bottom line is control over things that you had to accept as carved in stone before. Now with all of this in mind, let's take a look at the P-GRAM card.

I had in hand a hard-wired version on a prototype board, and it operated flawlessly the whole time I had it. There has obviously been a great deal of time put into the engineering and software development of this package. I just couldn't find a single bug.

The first thing you want to do when you get the P-GRAM is to print out the docs, all 46 pages of them. FORTY-SIX PAGES!! Don't get nervous. Instructions on getting started occur within the first 10, and if you know where the computer switch is, you can do it with ease. The docs are as clear as glass all the way through to the highly technical data in the last chapter.

Review

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

Cost: $150 Base Kit
Clock: $ 20
Card + clock built: $200
Manufacturer: Bud Mills Services, 166 Dartmouth Dr., Toledo OH, 43614

If you're a walking ad for the Horizon RAM like I am (I have three in my P-box), you don't want anything interfering with those little beauties. The idea of something with another CRU address switch draws persperation from my forehead at the mere thought. As it turns out, though, the P-GRAM likes switch No. 7(CRU 1600), so it never gets in the way of my three RAMs, or anything else for that matter. Setting this switch is the very first thing you should do, then you can go ahead and drop it into any remaining slot of your P-box.

The next thing is to load the DSR routine into the P-GRAM. This is just like loading the ROS into your Horizon RAM, and just as simple. It's provided with the software and will load from almost any cartridge. I used the EditorAssembler, but it can also use Extended BASIC or TI-Writer. I wanted to get the optional clock going next, which was just a matter of going into BASIC and typing CALL PTIME. I was then presentd with inputs for day of week, month, date, year and, of course, the time based on a 24 hour clock. So much for that! I also had to go into my RAM MENU with a sector editor and get rid of the string "CLOCK". This is so that the time would function in the upper right corner of my menu screen. No big deal, the docs tell you how to do it step by step.

OK, time to load a cartridge. Needless to say, the first thing I wanted to load in was my Super Extended BASIC. To me the most important fact involving this P-GRAM card is that NOTHING will ever have to be plugged into my cartridge port again. In as few words as possible, and just this simply, do it this way: 1) Install the cartridge you want to save and go to BASIC. Type CALL PG and this brings up a five-part menu.

2) Select No. 1, "Initialize GRAM". This clears and resets all of the GRAM/RAM memory, and takes about three seconds.

3) Put a disk into your drive and select "Save P-GRAM". Enter a file name and the cartridge is dumped to disk in 34 sector memory image pieces. How many pieces depends on how big the cartridge program is. The Editor Assembler is about one-sixth the size of SXB.

4) Select "Load P-GRAM" from the menu and enter the file name of the now disk-based cartridge.

5) Once the program is loaded, quit and shut off the console. Pull the cartridge and forget it. When you power up again, you will find the name of the cartridge on your menu. Press the corresponding key, and bingo, there's your cartridge, and there's nothing up your sleeve, or in the cartridge port. How simple can you make it?

The fourth selection of the menu is for the memory editor. This is where you can get into some really heavy hacking on whatever program(s) you have in the P-GRAM card. I'm not going to get into this too much, though, because frankly, other than some string manipulation with sector editors, I'm not well versed on this subject. Suffice to say you can shift whole blocks of memory around, print them out, and do whatever else you tend to do with sector editors. Frankly, I can find enough reasons to buy the card without getting into this stuff. I don't want to knock it, I'm just not into it. Other people are going to have a ball with this thing and, in short order, we are probably going to have all kinds of neat "cartridge" updates.

I want to stop here for just one second and talk a little about the community and how they deal with products, particularly hardware.

There are already a lot of GRAM-

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P-GRAM CARD —

(Continued from Page 38)

Krackers out there. I'm not sure how many, but a lot of them. The Gramulator is also a reality, and now along comes the P-GRAM card. It should be clear to people by now that these devices are not just a fad, but an important upgrade to the TI computer. The Horizon RAMcard proved itself to be the best of at least three or four cards of this nature, as will the P-GRAM prove itself in time. But the Horizon virtually sat on the shelf for a year or two before it took off. Why? Simply because people tend to be afraid of new upgrades. Generally speaking, though, there is no need to feel this way. Everything new that comes out is usually downgradable. In other words, it will work with whatever you have until new stuff takes hold. In the case of the P-GRAM, everything that has been worked on, or created with the GK will work with it. So there are a lot of things available already to help with this piece of equipment, along with the superb backup that Bud Mills gives his products. The more any single item gets sold, the more new products people will come up with to work WITH it. I know there are a few stingers out there, but when it comes from companies such as Bud Mills, Rave, and others that have supported their products to the hilt, don't sit on it. Work with it! 'Nuff said!

The P-GRAM is available as a kit for $150. This is cheaper than both of its predecessors for the initial product. The clock chip is a $20 option, but I can't conceive of anyone not wanting it. (Providing they don't have a Triple Tech card or some other stand alone clock.) For a fully assembled and guaranteed one it costs $180, or $200 with the clock installed.

The card has 72K of memory of which 8K is reserved for the DSR, etc., but I have been told that it can be added to later. (Don't quote me on that, though.) I don't know how much more you would really need. The card came to me with Editor Assembler, Disk Manager Three, and TI-Writer installed, but my SXB took over the whole allotted memory. What the heck, the idea is to get rid of cartridges and it sure does do that, plus everything else that you would expect it to. Your money will be well spent with this latest innovation from Bud Mills Services. It's straight "A" in my book.

Epyx 500XJ Joystick

Good for 11 hours of Space Marauders

By KEITH BERGMAN

Well, it finally happened. After a year and a half of faithful (if clunky) service, my TI joysticks began to fail. Soon, they were so unresponsive I had to get rid of them. They had served me well, but I decided to get some other stick.

About this time I remembered that not long ago a company had come out with a joystick modeled to fit into the human hand. The 500XJ sounded great, so I bought one.

After connecting it to my "Y" adapter (the 550XJ is a Commodore/Atari model), I tried it out on Parsec and Munchman. While it did not, as one ad says, "triple" my Munchman high score, I did notice improvement. The little Munch-person never missed a turn.

I should explain that the 500XJ is a "modern" stick with microswitches inside. These are supposed to make the 500XJ the most accurate stick around. However, there is a big drawback: The stick makes a little "click" when you move and a "clack" when it moves back to center position. This annoyed me to no end, but if you live near a subway or jetport you may not notice the noise.

While results with Munchman and Parsec were good, I was not impressed with the stick's handling on the diagonals. It seemed to get stuck in one of the four main directions now and then, and its overall response was not great.

I also tried the stick on Popeye, Barrage, Q*Bert, High Gravity and other games. The same things happened with all of these games, and that the fewer diagonals required by the game, the better I did. I also found that the fire button occasionally would stick a little with games that required lots of quick, repeated presses of the fire button.

I also tried the stick on Picasso Publisher, an art program. The stick worked great, and I think it was because a program like Picasso doesn't require split-second movements like a game. I really enjoyed drawing with the 500XJ.

As to why it gets an A+ under Ease of Use, let me define my terms. By Ease of Use I mean how good your hand feels after getting 7,976,883 at Space Marauders and gripping the joystick for 11 hours. The joystick is broad on top and narrower on the bottom. It films almost perfectly in the left hand. The fire button is on the right side so that when you hold the stick, your index finger is resting on the button. You middle finger gets a little finger rest, and the other two hold the narrow part of the stick. Your thumb parks itself into a little slot on the top, near the cord. This design is very good for your hand, unless you have a habit of keeping the joyhstick in a death grip. In that case, you'll have just as much hand fatigue as with any other stick.

This neat design is also a big drawback. The stick is designed for "the average hand." Small children have a very hard time using the 500XJ, if they can use it at all. And, if you have big hands, your fingers may miss the slots and leave you holding the joystick in such a way that you can't press the fire button.

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Review

Report Card

Performance	**A**
Response	**B+**
Ease of Use	**A+**
Value	**A**
Final Grade	**A–**

Cost: $19.95
Manufacturer: Epyx, 1093 Kiel Court, Sunnyvale, CA 94086
Requirements: Joystick adapter for TI

MICROreviews

Enhanced Display Package is a hit

By HARRY BRASHEAR

The following comments do not necessarily reflect the views of MicroPendium Magazine or its staff.

Ratings for the software reviewed in this column is based on a star system as follows:

★ Leave it alone, back to the drawing board.

★★ Needs improvements, but workable.

★★★ A good program, worth trying.

★★★★ Send your money and buy it.

The software is starting to roll in for this column, but, to date most of it has been coming from the notables. I know there are people out there with names we've never heard of, just waiting to be discovered. Please send us your programs, and let us know who you are. And send telephone numbers when you do. Sometimes I have questions that need to be answered, and that can mean a big difference in the ratings.

★★★★
ENHANCED DISPLAY PACKAGE

For many years various companies and individuals have attempted to put packs of "display enhancements" on the TI market.

Two things have always bothered me about these:

1) There are always a lot of unnecessary routines loaded up with the needed ones. You wind up with the whole low end memory filled with stuff you don't want.

2) They always have told us that if we use the package in a commercial or fairware product, we must kick back part of the money to them.

Neither one of the aforementioned problems comes with this package. The author wants you to use his product and just mention his name in the programing or the docs. The best part is that I can see usage for almost every routine in the series. Here is a list of a few of the features:

ACCEPT: Will allow up to 255 characters in an ACCEPT, something that every programmer I know has had need of.

DISPLAY: Many additional options over and above the Extended BASIC version.

CLOCK: Sets up an interrupt clock on the screen and can be fast-forwarded after disk access by holding down the FCTN and CTRL keys at once.

ALARM: Sets the clock to "wake you up" to something at a user defined time.

COLOR: Resets character set colors one or more at a time or all at once. Covers character sets -3 to 28. (Huh?)

SCROLL: Allows the screen to scroll forward or backward. This can also be a portion of the screen defined with WINDOW.

WINDOW: Set a portion of the screen defined with starting/ending rows and columns. This can be used in conjunction with ACCEPT, DISPLAY and SCROLL.

LOADR, LOADV: Allows the manipulation of VDP RAM.

FLASH: Allows a certain character set to flash between colors.

MODE: Shifts between graphic mode and 40 column text mode.

There are many other routines that enhance the ones that I have mentioned and they all work together very nicely. I might also point out that the extensive docs are fantastic and very understandable for a medium level BASIC programmer.

I think this package is worth the money. and you XBASIC programmers will probably wonder how you got along without it. I liked the whole thing and recommend you send your money and buy it. I am hoping we will hear more from this author in the future.

Send $15 for the manual and software, or $30 to include the source code, to: Paragon Computing, 17 Constance St., Merrimack, NH 03054.

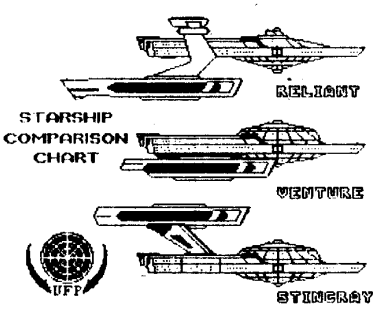
★★★
STARFLEET TECH. DRAWINGS

This one is four star if you're a Trekkie like me, or, if you're not, it's probably something less.

It's a three-disk set from Texaments for the piddling price of $9.95 and can be viewed via TI-Artist or Display Master. As a matter of fact, if you want to pull it from your dusty archives, there is a DM program on each disk that you can view the pictures with.

The pictures are without a doubt superb in every way. Stephen Barackman is the talented author of the pictures and should be encouraged to create more for us. Every one of them, (21 in all), are fully colored and comprise scenes as well as the technical drawings. Each ship that has appeared in the shows, old and new, is depicted in at least two views. Even the Klingon ships are given their due on one of the disks.

Pictures are either good or bad so there isn't much I can say about this offering. I'll just let the accompanying picture speak for itself and all of the rest in the package. (The picture is reduced from the original.—Ed.)



Send $9.95 plus shipping and handling to Texaments, 244 Mill Rd., Yaphank, NY, 11980. Telephone (516)345-2134

(See Page 41)

500XJ—

(Continued from Page 39)

The joystick is a welcome addition to computer clutter, unless you have a professional-looking, office-like setup. The thing is deep red — the color of a red Corvette. There is a big red label with black stripes that taper down, and a red handle. It looks sleek and stylish, but the sticker seems to have been put on there for another reason: to make it obvious when someone has opened up the stick and voided the five-year warranty (the sticker is one big piece).

The Epyx has some problems. It is definitely not the "perfect" joystick. But if you want a nice, responsive (mostly), sleek joystick, you can't go wrong with the 500XJ unless you have small hands. Borrow one from a friend or test drive one at a local computer store.

MICROreviews—

(Continued from Page 40)

★★★★ CARFAX ABBEY

Here's a nifty little fairware offering that I picked up, and it's just the thing for Tunnels of Doom fans. (There are a lot of you out there!) No, it isn't for the cartridge, it acts like it, but it takes up more of the screen. The graphics are excellent and the concept is well thought out. It seems that your mission is to destroy Dracula who has taken up residence in a 100-room building called Carfax Abbey. In doing so you have to find maps, keys, gold, use magic, and keep up your stamina.

The building is laid out with 25 rooms on a floor (four floors or levels), and you go between them by finding steps or an elevator. The game is not a mind buster because there is a little map of the floors on the upper part of screen so you know where you are at all times. It's not all that easy though because there are doors that need unlocking to go through and secret panels to find. There are some nasties to contend with, and a few decent sorts that want to sell you stuff for your gold.

The game itself is very well programmed and the use of some assembly routines in the graphics make it seem an A/L game instead of Extended BASIC. (I love it when XBASIC is used to it's best potential!) When the game is being set up, you are asked for a number to be input from 1 to 999. I suspect this is a seed number for the randomized structure, so you will be kept busy with this one for a long time to come.

I'm not much of an adventure freak, but this one is four star in every way that I can tell. It can be had from two sources: the author or as one of Tex-Comp's fairware library offerings. There it is known as "The Best of Britain Vol. 2." I would suggest you send your Yankee dollars to the author, however, so as to encourage him to do some more. Send at least $5 plus disk cost and airmail postage to: David Vincent, Wycroft, Foxhole Lane, Four Throws, Hawkhurst, Kent, TM18 5DT, England.

★★ ROCKETMAN

This one really left me scratching my head. Rocketman is a checkbook program designed with the 16-year-old newlywed in mind. The only thing it doesn't do for you is sign your name on the check. Both the docs and the program tell you what you have to do to your checkbook before you start program entries. They also tell you what to do if you have an error in the math. Honestly, I can't think of a program I've seen of this nature that did that, so that makes it good.

The documentation is professionally printed and came to me in a nice 9 X 12 binder. The docs are fine tuned to a point where a child could understand them and they are profusely illustrated. That makes it good!

This professional program allows you to select the option of rockets on your screen. That makes it bad, insults MY intelligence, and that of the rest of the TI community too, I think. Thank God, at least they are optional.

The program itself is short on error traps, and there is a lot of places that errors can be made. For instance, the standard input responses are "1 for YES, 2 for NO." For a community that is very used to entering "Y" or "N," I blew it almost every time... and then I would get the old "input error" warning that TI embedded. I checked out the programming and found no VALIDATEs anywhere. This was probably because almost all of the inputs are based on just that, INPUT! You are allowed to save results and call them back at a later time as well as printing out the total results.

I would have to say that as a teaching aid, Rocketman would be a fine program, particularly with the documentation. The problem is that no matter how I try to cast it off, something bothers me about it. I have the feeling that it's a translation from another computer or maybe the company just did it for TI as an afterthought. There's nothing wrong with that, if the translator knows what he's doing. I have the feeling that knowledge was short, or, since the copyright was for 1984, maybe nobody has looked at what's happened to us since then.

The price is right, $17, according to the REMs in the program. I would have given it three stars based on educational value, but that bad feeling just wouldn't let me.

Send money to: California Programs, 4426 Appian Way, El Sobrante, Ca. 94823

If you would like me to review your software in this column, please send it to me (Harry T. Brashear, 2753 Main St., Newfane, NY 14108) If you would like it returned, include a SASE.

'Internal Board' in works

A printed circuit board, the "Internal Board," is under development by Eric Zeno of Pittsburgh, Pennsylvania. He says the board can be constructed with any combination of 32K, clock with battery back-up, Extended BASIC that can be switched on and off and Speech Synthesizer.

All is internal to the console, Zeno says. He says the board will make it possible for "just about anyone" to solder together any or all of the above features and have to make only minimal wiring connections to the motherboard. The board will connect to the back of the GROM port with one-to-one solder fingers. He says the traces are brought out to the hollow cavity above the motherboard where there is plenty of room to add circuitry. Small modifications have to be made to the plastic on the inside of the console, but Zeno says "anyone can do" them. Switches, light and battery, may be added to the top for easy access or completely eliminated, he says. Plans are for the board to be double-sided and completely etched.

"If there is enough enthusiasm, the board will also have silk screen and solder mask so that even the novice can hardly make a mistake," Zeno adds.

He says cost is estimated to be between $5 and $15, and says he is interested in determining response. He says the more support for the board, the less the cost will be, and asks anyone interested in the board to write him at 414 Highland Rd., Pittsburgh, PA 15235.

Fair set in Ohio

The Lima Ohio User Group will sponsor a Multi User Group Conference 8 a.m.-6 p.m. May 20 in Reed Hall in the Student Activities Building at Ohio State University in Lima. Admission is free, as is display space for vendors and user groups. For information write the group at P.O. Box 647, Venedocia OH 45894 or call Dave Szipple evenings at (419)228-7109.

Newsbytes

TI Base v. 2.0 released

The release of TI Base 2.0 has been announced by Texaments.

According to Steve Lamberti of Texaments, enhancements to the data base program include new directives, enhanced printer control, improved sorting capabilities, the ability to convert non-TI Base files to TI Base format, decreased loading time and selectable cursor speeds. Price for the program in its new version remains at $24.95.

He says the new directives include SUM (individual fields may be summed for an entire database), SNAP (prints the current display), READSTRING (reads character string responses and automatically inserts the needed quotes) and TRACE (debugging aid similar to the BASIC Trace command).

The new CONVERT directive is applicable to almost all files generated by other databases and files created by TI-Writer in DV80 format, Lamberti says.

He says users can now specify printer control codes for their particular printers and print output may now be redirected to a file.

Sorting speed for large files has been improved, he says and a nested sort capability to a maximum of eight levels has been added.

Other enhancements he lists are new dynamic memory display, global system data, display of the LOCAL structure and a new FOR clause added to the SUM, REPLACE, PRINT and DISPLAY directives for filtered processing. The Tutor Disk has been updated to reflect the new features of TI Base, and is now menu driven so users may seek help on individual topics rather than the entire program.

TI Base v. 2.0, available for $24.95 (plus $2.50 for shipping), includes the system and tutor disks, a TI Base keyboard overlay and an instruction manual. It requires a disk system, 32K memory expansion and either an Extende BASIC, Editor/Assembler or Mini Memory cartridge. TI Base is now fully compatible with the Geneve 9640 (in GPL mode) and the Horizon RAMdisk, Lamberti says.

Current owners of TI Base may upgrade to v. 2.0 by returning their original system and tutor disks along with a check or money order for $7.95. Anyone who purchased TI Base after Nov. 1, 1988, may upgrade to v. 2.0 by returning the original disks, a dated sales receipt and a check or money order for $2.50. All upgrades are being handled directly through Texaments, Lamberti says. A new expanded 66-page manual will be sent with all upgrades.

For further information, or to order, contact Texaments, 244 Mill Rd., Yaphank, NY 11950 or (516) 345-2134 (voice) or (516) 475-6463 (BBS).

Donaldson Software releases programs

New programs have been released by Donaldson Software.

Swordfish Patrol is described as a graphic multi-screen airplane war game for the TI99/4A. The user flies a vintage Swordfish biplane in the service of the RAF during World War II. Tasks include destroying the Air Force of the Bismarck, sinking the Bismarck battleship, fighting German airplanes in the skies over Great Britain during the Battle of Britain and attacking the forces of Rommel (the Desert Fox) in Northern Africa. A user who completes all missions assigned will be sent home to Manchester Air Force Base. The game is programmed in TI Extended BASIC.

A BASIC version of War of the Netherworlds has been released. War of the Netherworlds is a two-player strategic space war game, a race between Draconis and Cygnus 5 for the conquest of 12 moons and each other's forces. The Speech Synthesizer and TEII module are recommended.

Monster Castle is a graphic adventure game for ages 8 through adult, described as being in the style of D&D or Tunnels of Doom. The user takes on giant spiders, crazed bats, ghosts and other creatures in an attempt to become owner of the castle and its treasures. There are more than 19 rooms and 10 floors. The game is programmed in Extended BASIC.

Sun and Planets includes a graphic display, on command, of the sun or any planet in the solar system, and information on the number of moons, surface gravity, size, distance from the sun, angle of rotation and more, based in relation to the earth.

Two Extended BASIC games on one cassette are Speed Rally and TI-Pac Man. Speed Rally is a racing car game and TI-Pac Man is described as a version of Pac Man with a slightly more difficult maze.

All programs are on cassette and each cassette is $8.95 U.S. A catalog of all games is available for $1.50 U.S. For information or to order, write Donaldson Software, 521 Lievre St., Buckingham, Quebec, Canada J8L 2C2.

Asgard Software has new phone number

Asgard Software has moved and has a new telephone number effective Dec. 30, (703) 255-3085.

The company's mailing address remains the same, P.O. Box 10306, Rockville, MD 20850.

Asgard president Chris Bobbitt says he believes the word processing program Press will be shipping before Jan. 1. He says manuals and packages are ready, but shipment has been awaiting program debugging.

Newsbytes is a column of general information about products and services related to TI and 9640 users. The publisher does not necessarily endorse products listed in this column. Vendors, manufacturers and others are encouraged to submit items for consideration. Materials cannot be returned.

MYARC HARDWARE
Geneve 9640
HD Controllers
Floppy Controllers
512K Memory Cards
Geneve Memory Cards
RS232 Interfaces
Hard Drives
Call our office and make your best deal.
Texaments
(516)345-2134

User Notes

Advice on using HFDC emulate files

Donald Alexander, of Macon, Georgia, writes:

When using emulate files on your hard drive make sure all files are closed before re-setting or turning the computer off. If a file is left open, the emulate file will be ruined.

If this happens to you, the only way to correct it is with MDM5. If you have not saved a copy set to run from DSK2, then it will not load normally. What you will have to do is turn the hard drive off and load from your first floppy drive. It will take about 50 seconds before the drive is accessed.

When MDM5 comes up, inactivate the emulate file and delete it. You will have to re-do the emulate file.

If you are running your hard drive in the expansion box, be sure to keep a copy of MDM5 configured with "setup" to run from DSK2. If not, you will find yourself waiting until you can get a copy from Myarc or another source.

Notes on using Font Writer II

This comes from Joe T. Rawlins, of Groveland, Massachusetts. He writes:

I use Font Writer II (by J. Peter Hoddie) extensively for all my correspondence. The first time I tried to use the double density (.DS) and double width (.DB) printing at the same time I found that I could not set a left margin or an indent past the center of the page.

By examining the code of the Extended BASIC portion of the program (TEXT), I was able to locate the offending line of code. The second part of line 250 reads:
:: N2=(LM-IN*NP)*M*DS/DB ::

This line sets the left margin in dots to be sent to the assembly portion of the program. With double density and double width set DS and DB are both set to 2, however, they cancel each other out so you are not allowed a left margin past 480 dots. I changed the line by deleting "/DB", thereby allowing a maximum left margin of 960 dots (the maximum right margin). I also deleted "/DB" in the third section of this line for the same reason as applied to centering.

As with any changes made to a BASIC program, you should *SAVE DSKn.PROGRAM,MERGE*, then immediately, without doing a NEW, *MERGE DSKn.PROGRAM* and finally *SAVE DSKn.TEXT*. This will keep execution time at a minimum, as all lines will now be sequential in memory. If you do a NEW before merging, you will lose the tagged object code that is part of this program.

A FEW APPLICATION NOTES

The graphics mode margins of 0 to 59 represent 480 dots per line in single density and 960 dots per line in double density. When adjusting margins or indents for different fonts a unit is not equivalent to a character to but 8 dots in single density.

The page length (.PL) and blank lines (.BL) commands are the number of 1/6 inch high lines, no matter what your font height may be.

The spaces (.SP) and line spacing (LS) are determined by the font height.

If you experience extra line feeds and the text you expected is not printed at all, or in part, your line length is most likely too short for the font being used.

If you have to convert a font from TI-Artist to CSGD you should use Graphics Expander instead of the Font Manager. There appears to be a bug in Font Manager that may garbage some of the characters in the saved CSGD font.

Multiplan RAMdisk bug corrected

This comes from Paul Flesner, of Prospect Heights, Illinois. He writes:

I discovered a "bug" in the article by Mike Dodd regarding the conversion of Multiplan to load from the Horizon RAMdisk (March 1988). Here is a "fix" which is in addition to the changes described in the article:

Use a sector editor to make two changes in the file MPINTR. Both are found in the second sector of the file. Display the sector in ASCII. At bytes >86 through >95 you will see DSK.TIMP.OVERLAY. At bytes >98 through >A5 you will see DSK.TIMP.MPHLP.

Change both of these files to fit the location of your RAMdisk (i.e. DSKn.OVERLAY and DSKn.MPHLP). Since the new name will be shorter, overwrite the four extra characters with zeros.

The byte immediately preceding the file name must also be changed to reflect the new length of the file name. Switch the sector display back to hex and change the byte at >85 to 0C (DSKn.OVERLAY is 12 characters long). Change the byte at >97 to 0A for the DSKn.MPHLP file name. That should do the trick.

One additional note: I found that if I changed byte >58 in the third sector of the last MP cartridge (MP4) file, Multiplan would not load. I left it as >0F instead of changing it to >0B and the load proceeds correctly. However, it might have something to do with the fact that my Multiplan cartridge is saved as files MP through MP5. If you have that problem, at least you know where to look.

A little reminder

This comes from Enrico Gasperini, of Towaco, New Jersey. He writes:

I have just finished typing the MICROpendium Index program and I am sure it will be a great help to readers when a particular article is needed. There is one thing that I find a bit uncomfortable, and that is the long sorting process. I guess that is how the name LONGSHELL came about for the subroutine. It almost seems as though the program has crashed.

I have added one line to the program to show that something is happening during the sorting and let the operator know that he will just have to wait a bit. The line is:
855 DISPLAY AT(23,13):I :: DISPLAY AT(24,11):"(SORTING)"

Caps key speeds up cursor movement

This comes from Norberto R. Bettinelli, of Buenos Aires, Argentina. He writes:

I have realized that when using my Geneve, if I press any key, keeping it pressed, its repetition is speeded up twice as fast as soon as I press the Caps Lock key. No need to hold the Caps Key down. I thought this was going to be mentioned by you long ago, but since you have not done it I offer this tiny piece of information to my other

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User Notes

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Geneve owners through your courtesy.

Tips on MDOS

Bob Sherburne, of Las Vegas, Nevada, has a few MDOS tips to contribute. He writes:

I would like to pass along a few undocumented features of MDOS V1.08. We can now change the character and screen colors in MDOS. MODE F5 will set the character color to dark blue. MODE B2 will set background color to black. Colors 2-16 can be used. MODE can be used in AUTOEXEC or the following batch file will allow the user to enter both foreground and background colors at the same time from the command line:

MODE F%1
MODE B%2

The user simply enters the name of the file with the F and B colors separated by a space, and the colors will be changed, i.e. if the batch file were called COLOR, entering COLOR 5 2 would change the colors to dark blue on black.

A second new feature lets the user search for only certain types of files when running a directory. DIR 'DV will list a directory of Display/Variable files only. The "'" character is the one under the tilde. Other file types to run directories on are DF (DIS/FIX), IV (INT/VAR) and P (Program).

Loading Funnelweb on the Geneve

This comes from Garry J. Christensen, of Kippa-Ring, Australia. He writes:

The program that I use most on my Geneve is Funnelweb, but loading it required that the Editor/Assembler or Extended BASIC module files were loaded first. It is the small things that seem to annoy me, and I found this a most unproductive waste of time. The answer was simple: Set Funnelweb up so that it loads as if it were a module.

The first step is to configure Funnelweb as you want to use it, then run the program CT8RAM that is on the Funnelweb disk. The following assembly language program will save Funnelweb to disk in a form that can be loaded by the GPL cartridge loader.

```
* FUNNELWEB SAVER (Ver 3)
* by Garry J Christensen
*
* First configure FWB, execute
* CT8RAM then this programme.
* FWB can now be loaded by using
* DSKn.FWB.
* NOTE: There is no error
* trapping. Be careful.
*********************************
*
       DEF  START
       REF  VMBW,DSRLNK
*
HEADER DATA >000B,>1FFA,>6000
PAB    DATA >0600,>1000,0,>2000,>0008
       TEXT 'DSK1.FWB'
*
START  LI   R0,>1000
       LI   R1,HEADER
       LI   R2,6
       BLWP @VMBW     write header into VDP
       LI   R0,>1006
       LI   R1,>6000
       LI   R2,>1FFA
       BLWP @VMBW     write FWB into VDP
       LI   R0,>0F80
       LI   R1,PAB
       LI   R2,>0012
       BLWP @VMBW     write PAB to VDP
       LI   R0,>0F89 address of size byte
       MOV  R0,@>8356
       BLWP @DSRLNK   save FWB
       DATA 8
       BLWP @0        finished
       END
```

Computing retirement income

This program can help define a new meaning to life for those who are beginning to think about retirement. The new meaning is that you should spend your life saving for retirement.

The program, by Roy Tamashiro, appeared in a number of user group newsletters. Based on user inputs, it calculates the amount of money needed to enjoy a retirement in the manner in which you have become accustomed.

What it really does is tell you how miserable you are going to be. While it provides only a rough estimate of what you can expect to earn on interest from retirement savings, the results can be eye opening.

Retirement Income Analysis runs out of BASIC or Extended BASIC. Here's what you will be prompted for when running it:

This year is: 19--

Current Monthly Income: (Enter monthly gross income.)

Inflation Rate (%): (Make an educated guess. It's about 4 percent now.)

Years to Retirement: (Subtract present age from retirement age.)

Amount Invested for Retirement: (Include all retirement assets, including IRAs, pension plans, annuities, etc. but not non-retirement investments, social security or savings.)

Assumed Interest Rate (%): (Estimate average annual interest or dividends on retirement investments between now and retirement age.)

Annual Additions to Retirement Investments: (Estimate amount you will add each year.)

Many experts say that you need about 75 percent of your pre-retirement income, but with inflation included in the calculation, the monthly figure at retirement is likely to be higher than your present income.

Social Security benefits are not included in the analysis, nor are the taxes you will owe on tax-deferred investments. You may want to adjust the recommendations given to account for these and other omitted factors.

```
100 REM ************** !006
110 REM * RETIREMENT * !077
120 REM *   INCOME   * !137
130 REM *  ANALYSIS  * !242
140 REM ************** !006
150 REM 1988, ROY TAMASHIRO
!162
160 DEF RATE=IT*.01 !045
170 GOSUB 410 !235
180 INPUT "This Year Is: 19"
;NOW !251
190 INPUT "Current Monthly I
ncome:$";MONTHLY !024
200 INPUT "Inflation Factor(
%):";IT !146
210 INPUT "Years to Retireme
nt:";YEARS !071
220 NEEDED=INT(((.75*MONTHLY
)*(1+RATE)^YEARS)+.5)!026
230 INPUT "Amount Invested f
or retire- ment: $";B !218
240 INPUT "Assumed Interest
Rate(%):";IT !096
250 INPUT "Annual additions
to retire- ment investment $
";ADD !162
260 FUTURE=INT(((B*(1*RATE)^
YEARS+ADD*(((1+RATE)^YEARS-1
)/RATE))*RATE)/12+.5)!145
270 GOSUB 410 !235
280 PRINT "You will need abo
ut $";NEEDED;"per 1 month wh
en you retire in";1900+NOW+Y
EARS !009
290 PRINT :"You can expect t
o receive";"about $";FUTURE;
"per month on" !241
300 PRINT "your investment i
```

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User Notes

(Continued from Page 44)

```
nterest or dividends." !092
310 IF FUTURE>=NEEDED THEN 3
90 !130
320 PRINT :"If you will have
 no other":"income, then you
 should":"increase your inve
stments" !027
330 FIX=INT(((12*(NEEDED-FUT
URE))/RATE)/(1+RATE)^YEARS+.
5)!153
340 PRINT "by about $";FIX;"
to":"$";FIX+B;"this year, or
" !063
350 MORE=INT((((NEEDED-FUTUR
E)*12)/RATE)/(((1+RATE)^YEAR
S-1)/RATE)+.5)!107
360 PRINT "raise your annual
 additions by $";MORE; !222
370 PRINT "to total ":"$";MO
RE+ADD;"per year." !143
380 GOTO 400 !224
390 PRINT :"You are in an ad
equate    investment positio
n for your retirement." !132
400 END !139
410 CALL CLEAR !209
420 PRINT " RETIREMENT INCOM
E ANALYSIS" !252
430 PRINT " ==============
==========" !208
440 RETURN !136
```

1989 Fairs

FEBRUARY

TI-Fest West '89, Feb. 18-19, Clarion Hotel at Balboa Park, San Diego, California. For information, write TI-Fest West c/o Southern California Computer Group, P.O. Box 21181, El Cajon, CA 92021 or call the SCCG BBS, (619) 278-7155, and leave a private message to the sysop with your full name and address.

MARCH

TICOFF (TI Computer Owners Fun Faire), March 18, Roselle Park High School, Roselle Park, New Jersey. For information, write TICOFF'89 c/o Roselle Park High School, 185 West Webster Ave., Roselle Park, NJ 07204, or call Robert Guellnitz at (201) 241-4550 or (201) 382-5963 or the TICOFF BBS, (201) 241-8902.

MAY

Multi User Group Conference May 20, Reed Hall/Student Activities Building, Ohio State University, Lima, Ohio. For further information write Lima Users Group, P.O. Box 647, Venedocia, OH 45894, or call Dave Szipple evenings at (419) 228-7109.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. Events will remain listed throughout the year.

Rounding numbers

This item appeared some time ago in the newsletter of the Mid-Atlantic 99ers. The subroutine was created by Maurice Swinnen.

The quickest way to round numbers is to use:

RESULT=INT(NUMBER+0.5)

However, what if you want it rounded to more digits? You could do this:

RESULT=INT(NUMBER*P+0.5)/P

In this case, "P" equals the power of ten of the number of places to be rounded.

To round to two places you would use P=100(10 2).

This format work only on positive numbers. For numbers which may be either negative or positive use this formula:

RESULT=INT(ABS(NUMBER)*P+0.5)*SGN(NUMBER)

Try the following subprogram to round numbers in your Extended BASIC programs. For BASIC, remove lines 100 and 130 and call the formula using GOSUB.

```
100 SUB PLACES(NUMBER,PLACES
,RESULT)
110 P=EXP(PLACES*LOG(10))
120 RESULT=INT(ABS(NUMBER)*P
+0.5)/P*SGN(NUMBER)
130 SUBEND
```

To test it, use the following three lines which asks what 23456 round to 3 places is:

```
1 CALL PLACES(23456,3,RESULT)
2 PRINT "Result:":RESULT
3 STOP
```

How to subscribe to the networks

Left out of the telecommunications article this month are phone numbers to subscribe to the networks. And, we haven't mentioned the names of the sysops.

Here are toll-free phone numbers (the number fo Delphi was not available at presstime and will be published next month).

CompuServe 800-848-8990
GEnie 800-638-9636
The Source..... 800-336-3366

Sysops are:

CompuServe — Jim Horn, Jonathan Zittrain and Barry Traver.

Delphi — Art Byers, Paul Gray, Walt Howe, Jerry Coffey, Bob Boone, Dick Evans and Richard Fleetwood. Jeff Guide is the system manager.

GEnie — Scott Darling, John Johnson and Barry Traver.

The Source — Blaine E. Crandell and Walt Howe.

A few PEEKs and CALL LOADs

Here are a few CALL LOADs and CALL PEEKs from a column by Bob Carmany that we saw in the Hunter Valley 99ers User Group newsletter. (The group is based in New South Wales, Australia.) Some of them have appeared in MICROpendium several years ago, but we think they're worth repeating.

CALL LOAD(−31962,100,155) — executes RUN

CALL LOAD(−31962,100,126) — execute NEW

CALL LOAD(−31962,100,136) — execute default RESequence

CALL LOAD(−31962,160,04) — execute RUN without prescan

CALL LOAD(−31961, 149) — automatic RUN DSK1.LOAD

CALL PEEK(−31877) — VDP status register

CALL PEEK(−31878) — highest number sprite in auto-motion

CALL PEEK(−31879) — VDP interrupt timer

User Notes **is a column of tips and ideas designed to help readers put their computers to better use. The information provided here comes from many sources, including TI user group newsletters. MICROpendium pays $10 for any item sent in by readers that appears in this column. Mail User Notes to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.**

TELECOMMUNICATIONS

(Continued from Page 37)

membership fee which may include several free online hours.)

I don't think there is any way to get around this. The learning curve for telecommunications is unavoidable, even though the networks provide plenty of online hand-holding for new users through manuals and online aids. In addition to learning a vocabulary of terms, neophytes must become proficient at wending their way through the various libraries, forums and conferences. They are like wanderers in a giant cave. Even the best manuals can't compensate for the inevitable time-wasting that occurs as the new user learns to find his way through the hundreds of "rooms" that dot the cave. Simple curiosity will increase the cost of new subscribers as they take sidetrips to visit the SIGs of other computer brands, not to mention the electronic shopping malls, online game libraries and other delights.

Here are a few tips for new users that can help take some of the sting out of those first months of telecommunications charges:

1. Never go online during prime-time hours. (See the October installment for details on prime and non-prime time hours.)

2. Read the manual *before* going online.

```
**************************************
Number: 2074  Name: DM1000/ARK
Address: SPEEDWAY.500  Date: 890219
Approximate # of Bytes: 13840
Number of Accesses: 73  Library: 8
**************************************
Description:
DM-1000 version 4.0, no documentation was available, size is now 3 files long.
No new items on menus, found this on Bob Boone's bbs.  52 sectors.
Keywords: DM-1000, DM1000, MGR1, MANAGER
**************************************
```

In particular, study the menu structure of the board and know what escape command is used to break from an operation. (For example, a CTRL P in some cases sends a break signal that tells the host computer to stop doing what it was doing before the break signal was sent. This is useful when you've instructed the host to search an entire database for something or you've started downloading a long file that you've decided you don't want.)

3. Don't try to save money on your first connection. Figure that you will spend 4-8 hours online just playing around. If you can't afford to do this, you probably can't afford telecommunications.

4. Log your online sessions to disk. You can then review the session to learn from your mistakes.

5. Once you have a basic understanding of the navigational commands on the board, you'll begin to pick up tricks that save time and money.

6. When you need help, leave a message with the Sysop at his *address*. While the Sysop may not be online when you are, he will reply to your message as soon as he goes online.

7. Don't be impatient. It is common for a delay to occur between the time you enter a command and the time the host computer responds. This shouldn't take more than a few seconds but even when it is longer, just wait. If the wait lengthens to a minute or so, you may want to use your break command. If the delay continues you may want to go offline, as the host computer may be tied up with too many user requests to respond quickly to any of them. Go back online when it's not so busy.

8. If at all possible when going offline, use the board's specified command — bye, off or something similar — rather than just turning your modem off. If you just turn the modem off, the host may not be aware for several minutes or more than you are no longer connected. Meanwhile, you will continue to be billed for those minutes until the host is aware you are offline.

THE BIG QUESTION

We're finally at the big question: Which network deserves your membership fee and online dollars? MICROpendium monitors all four of the networks on a regular basis. Our experience is the CompuServe, GEnie and Delphi have very active TI-SIGs, huge software libraries, and active message bases. The Source, on the other hand, while easier to use than the other three, has shown little message activity over the past several months and little growth in its software library. It's subcategories are primarily filled with information that was uploaded months or years ago. Also, The Source has a minimum monthly fee of $10 whether you go online or not, a regressive practice.

Each of the networks has a personality of its own, with Delphi trying to establish itself as a "techie" outpost while CompuServe is secure as a mature and highly evolved information service. GEnie began chasing the TI market in 1987 and has provided a diversified TI-SIG with much to offer.

If you have the bucks for the initial signup fee, you couldn't go wrong by signing up for all three.

Correction

The first installment of this telecommunications article stated that GEnie charges 8 cents per minute during non-prime time hours. The cost actually is 8.3 cents per minute at 300/1200 baud.

FEEDBACK—

(Continued from Page 8)

>A5A5) it will create a block even if you didn't specify one, and will eliminate it altogether if asked to.

In contrast to Mike's comment that in a memory page disassembly you must accept the addresses of >A000 and >C000, you can actually simulate ANY memory location, so that labels will be generated properly. Also, since the program is not only unprotected but unencrypted, you can easily change the default colors and device names. This is outlined in the manual addendum.

I hope that all 9640 owners will enjoy this program. Cost is $22.95, available from T and J Software, 515 Alma Real Dr., Pacific Palisades, CA 90272.

Tom Freeman
Pacific Palisades, California

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