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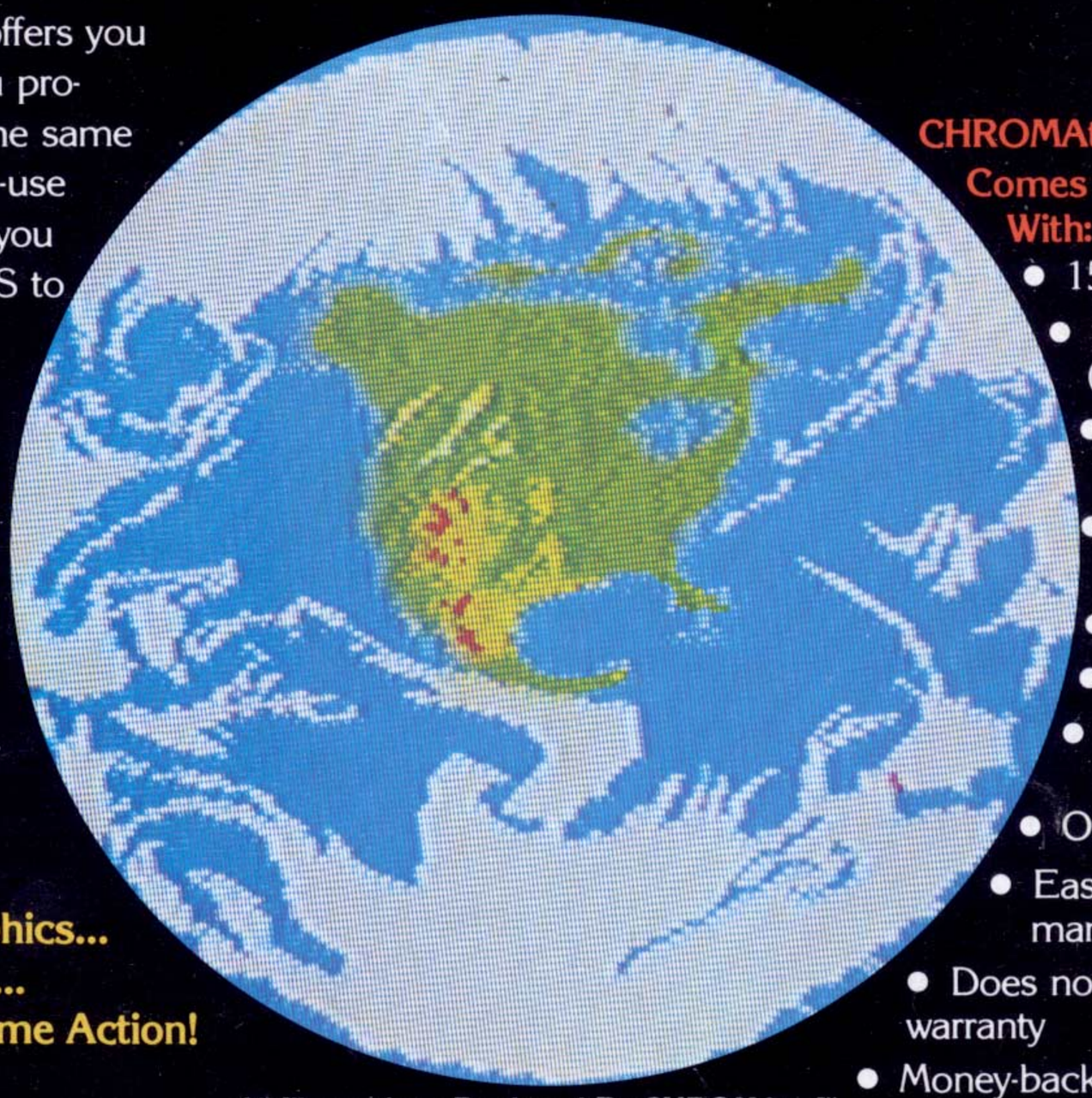

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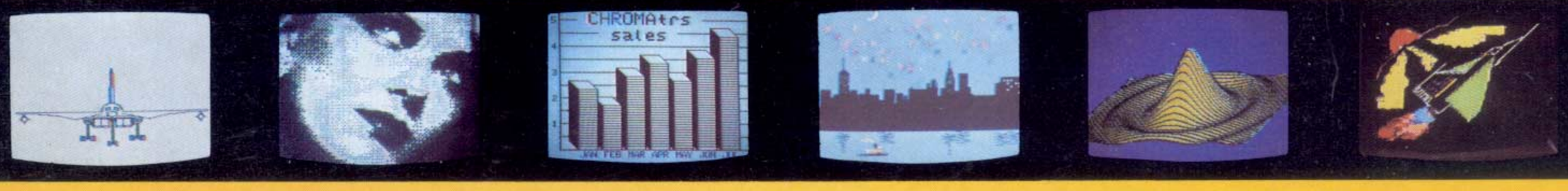

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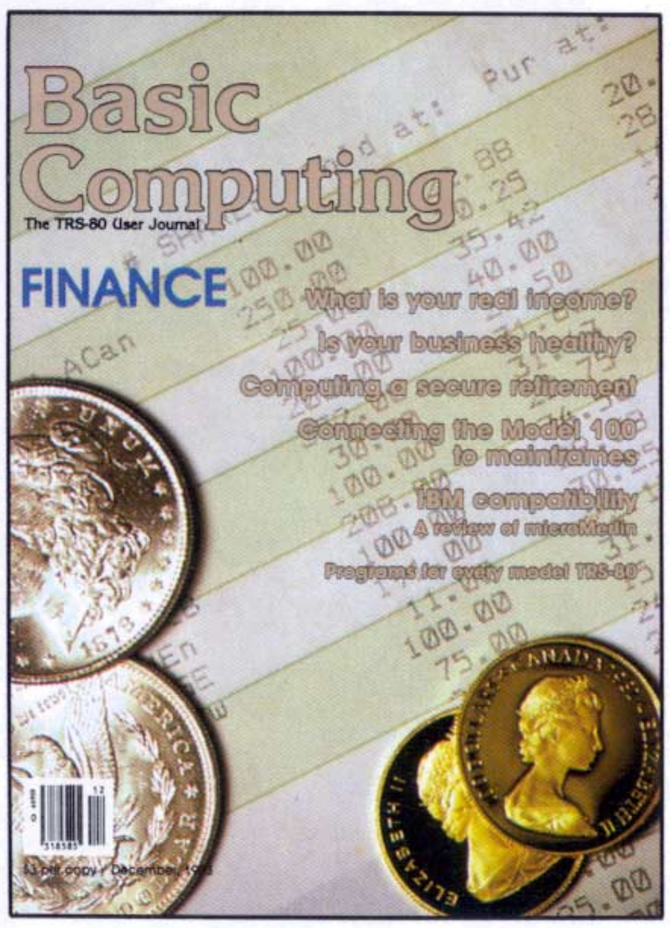
ISSN Publication #0745-9912. Basic Computing is published monthly by 80-Northwest Publishing, Inc., 3838 S. Warner St., Tacoma WA 98409-4698. Printed in the United States of America.

POSTMASTER: Please send change of address form 3579 to Basic Computing, 5615 West Cermak Road, Cicero, Illinois 60650. **Second Class postage PAID at Tacoma, WA and additional entry points.**



Our cover for this Finance issue shows precious metals resting on a stock market report that was generated by VisiCalc on a TRS-80 Model II. Our photographer was Frederick A. Johnsen of Tacoma, Washington.

Basic Computing

The TRS-80 User Journal

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Editorial

By Cameron C. Brown

I had a most interesting phone call recently. An advertiser called to find out why we had not run his new product announcement in the same issue with his ad. I told him that we receive hundreds of announcements each month and we just didn't have the room to run them all. It so happened that his product was scheduled for the next issue.

It was the conversation that followed that amazed me. I suggested that the product be forwarded to us for a review and we would send it off to an appropriate reviewer. It turns out that our reviewing procedure is quite different from other magazines. We ask that all material be sent to us and we assign it to a reviewer. We never guarantee a favorable review, we never accept prototypes or pre-release versions, we never demand that we be able to keep the material, we never promise publication of a review, we never allow advertising to dictate if a review is done, and we never send reviews to a company for "approval" before publication.

Other publications do it differently. According to the president of this company, his experiences were quite different. One publication guaranteed a favorable review if they could keep the product. Another stated that if the reviewer could keep the product, he would write a more favorable review. Another one said they would review it if he advertised. Other publications would take a pre-release or prototype. One magazine refused to run a new product announcement since it was not already typeset or written in their style.

Yegads! We here at *Basic Computing* are as human as anyone else, but such a gross departure from ethical behavior never even occurred to us. Reviews serve two audiences, the readers and the manufacturers. To compromise the accuracy of a review to increase a publication's advertising revenue or hardware library violates the trust of the reader and does a disservice to all of us. Reviewing prototypes helps no one. Only by reviewing exactly what the reader will be buying can we accurately report on a product.

Demanding that new product announcements be tied to advertising, or that they be in camera-ready form denies smaller companies with innovative products from ever becoming known.

Telling a manufacturer that giving away the product gets a better review is just another way to say "We (and our writers) want to be bribed."

We plan to go on just the way we are. We will print no review before its time.

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Notes, etc.

Cameron C. Brown

Model 4 A/O Error

If you happen to exit a program without closing the files, TRSDOS 6.0 will display the files with a ? in the directory. If you attempt to reopen the file, an A/O (file already open) error will result. It turns out that a trick which works on the Model II will also work here. From TRSDOS ready, type LIST *Filename*. The list command displays the file on the video, and also closes the file! Now the file can be opened again without any problem. The TRSDOS command RESET will also close the file.

TRSDOS 6.1

Radio Shack now has TRSDOS 6.1 available for the Model 4. It is catalog number 700-2247. Current users of TRSDOS 6.0 should get the updated version.

Model 4P Caveats

The Model 4P, Tandy's portable version of the Model 4, will support up to four hard disks, but no extra floppy disk drives other than the two that are built-in. It does not contain a Model III ROM but will operate Model III Disk BASIC programs. It will load Model III TRSDOS as well as TRSDOS 6.0. The Model III ROM is stored as disk files on the operating system and can be loaded into RAM.

Model 4 Speed

The Model 4 can be run at Model 4 clock speed (4 MHz) while in Model III mode. Just POKE 16912,64 and that's it. To slow it down POKE 16912,40. Other values can alter the video and turn the clock on and off. There may be a problem with disk I/O at the higher speed but we have yet to have any trouble. Our thanks to Kenneth Haagenson for the tip.

Corrections

In our October 1983 article, "The Hows and Whys of Model I/III CP/M," by Harry Avant, we gave the wrong address for Microcomputer Technology, Inc. MTI may be reached at 1530 So. Sinclair, Anaheim, CA 92806 (714) 979-9923. Hurricane Laboratories, Inc., another supplier of CP/M upgrades for the Models I and III that we listed is no longer in business.

The August, 1983 article "Wordfind," by Patrick Morgan, was labeled as being Color Computer-compatible. We were wrong. The screen layout and memory size needed for the arrays make it impossible to run on the Color Computer. If anyone has successfully converted it, please tell us. Our apologies.

Our October, 1983 review of the "User's Handbook to the TRS-80 Model II Computer" failed to give

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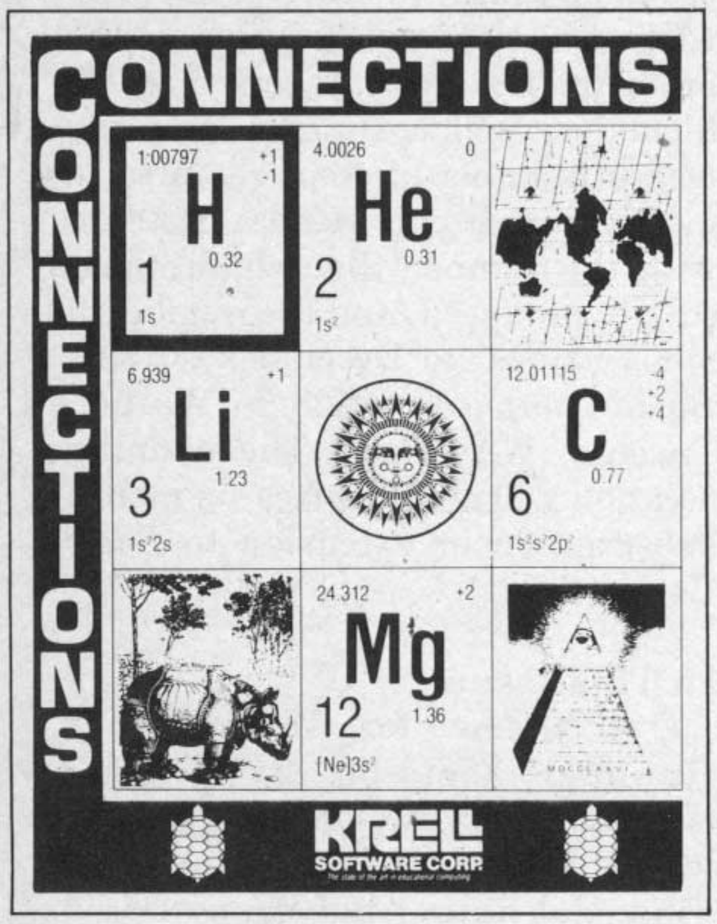

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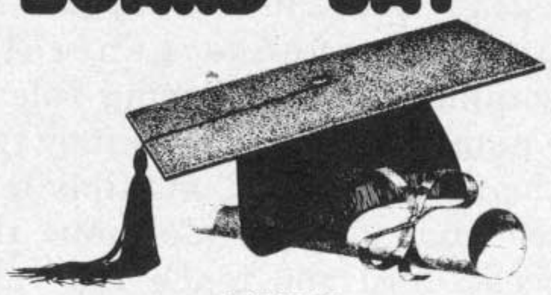

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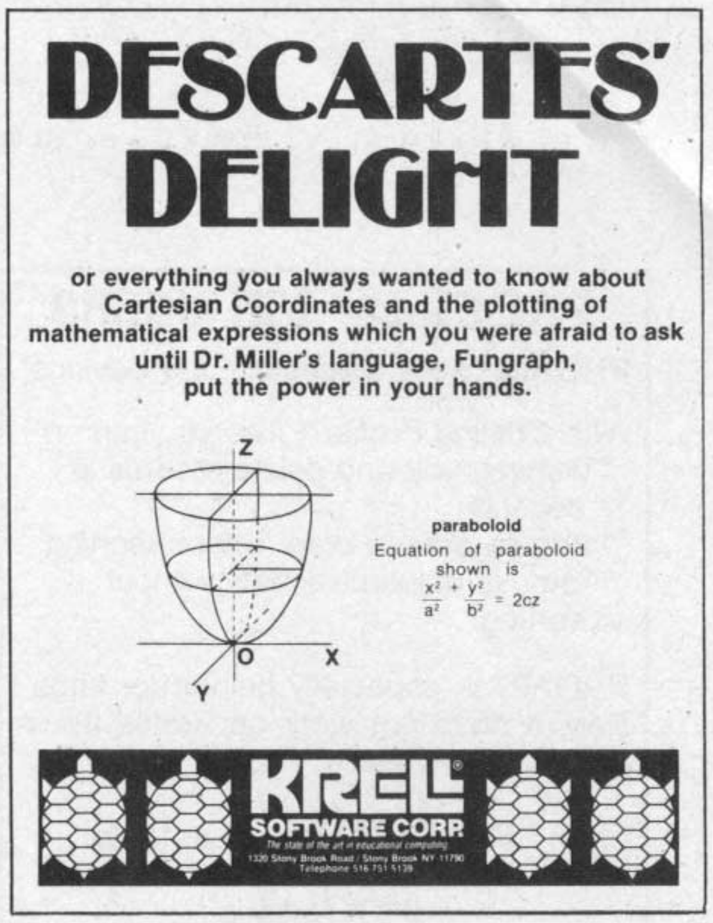

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Puzzler

We certainly have some mathematicians out there. Our October Puzzler concerned something called Ulam's hypothesis and we were flooded with correct answers (and a few not so correct). Readers were asked to find the integer(s) from 2 to 500 that gave the longest sequence generated according to the following rule: If the number is even, divide it by two. If the number is odd, multiply it by three and add one. Continue this process until you reach the value one. It turns out that the number 327 gives a sequence that is 144 numbers long (that includes the number itself and one). The correct solutions were put into a box and the winner was selected at random. Our congratulations to Mr. Bill Coulter of Boulder, Colorado. We hope he enjoys his free six-month subscription to *Basic Computing*. We did receive some fascinating solutions. One solution was in Alcor Pascal and another was in C. The C programmer did his on a Vax 11/750 and even ran the problem up to 100,000. For those who are interested, the number 77,031 gave the longest sequence (351 numbers).

In the past year we have given puzzlers of various types. The greatest response has always been for those that were mathematical in nature. To help keep the cards flowing, we have another one. The problem comes from a book I have enjoyed called *Tomorrow's Math* by C. Stanley Ogilvey, Oxford University Press. Add any number to its reversal. If the sum is not a palindrome (reads the same forwards as backwards), repeat the process until a palindrome is obtained. For example, 459 reversed is 954. Their sum is 1413 and it is not palindromic. The reversal of 1413 is 3141 and their sum is 4554. This result is palindromic, so the process stops after two steps. It is conjectured that reaching a palindromic result will not always happen, but 97.5 percent of the integers below 10,000 will produce a palindrome in 24 or fewer steps. When the process fails, it really fails. The number 196 fails to produce a palindrome in 37,303 steps and at that stage the numbers being reversed contain more than 15,500 digits. In designing your code, don't worry about leading zeros. The reversal of 120 is 021 or just 21. We are dealing only in base 10; the problem takes on different results when you change base. Here is the problem: For the integers 5 to 80, inclusive, which number has the largest number of steps required to give a palindrome? Send a postcard with the number, the palindrome it finally produced, and the number of steps it took, to December Puzzler, *Basic Computing*, 3838 So. Warner, Tacoma, WA 98409. The winning solution will obtain a free six month subscription or extension to *Basic Computing*.

In This Issue

Our theme for December is finance. Yield-80 by George Kwascha lets you determine the true worth of tax-free income and Financial Ratio Analysis by David P. Yon gives sophisticated business analysis to even the smallest of companies. Those of you with larger companies will certainly want to read the comparative review of two general ledger packages by Beth McDonald. If the IBM-PC has your interest be sure to read Harry Avant's review of the microMerlin. It gives you IBM-PC-compatibility on your TRS-80!

Profile gets a work-out this month. Tim Bowman shows how to get at Profile III+ data files from BASIC and Terry Dettmann looks at Profile II's use of logical and physical records. John Wright's Break-break shows all of us how to implement one of Profile's nicer features in any of our own programs.

A new year is beginning and we have two calendar programs. One is for the Models I/III and CC and another is for the Model 100. Our new technical editor, Greg Sheppard, has been busy converting programs to make them compatible with different machines. Many of the program rewrites in this issue are his. You can look forward to seeing more and more programs for your model in the upcoming months.

Some of you may be looking for an annual index to the magazine. It will be in the January, 1984 issue. We plan to have all articles sorted by model. It should make it easier to find what you want. Until next month, a very happy holiday season to all of you.

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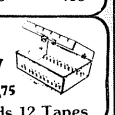

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Refer to advertiser index for reader service number

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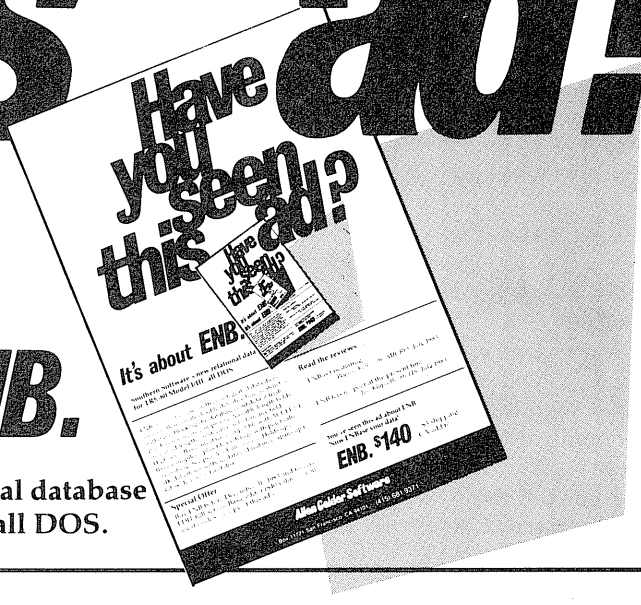

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Southern Software's new relational database manager for TRS-80 Model I/III, all DOS.

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Letters to the editor

Cameron C. Brown

I have received my first copy of *Basic Computing* in lieu of my former magazine, *H & E Computronics*. When I was informed that this change would occur, I was not without some misgivings. Was my good old *H & E Computronics* to be replaced by something that might not appeal to me?

I must say that I am quite pleased with the new publication and am looking forward to future copies. I am hoping that articles about the TRS-80 Model I will not soon disappear as they have practically done in some other magazines.

D. Brent McRae
Santa Barbara, CA

Our latest survey shows that 45 percent of our readers have a Model I. As a matter of fact, they average 1.42 computers per reader! We have no intention of ignoring the Model I audience. --Ed.

VisiCalc Lister by Arnt Sviland, September 1983, is real neat. It could be even neater with a comma at the end of line 280, thereby printing the results in a table rather than a long cumbersome printout. I'll even supply the comma (,).

Albert A. LeShane, Jr.
Portland, CT

I purchased the Radio Shack Accounts Receivable package (#26-1555, Model I) several days ago, brought it home, fired it up, and it was going to answer all my needs. Wrong!

After about four hours of entry, I was ready to do some printing and I saw "Printer not ready". I found several print instructions that were directed to the wrong address. I operate an early Model I with four drives and a LP I (Centronics 779) dot matrix printer. I made the following changes in these subroutines: Accounts Receivable Setup program: 1190 IF (PEEK (14312) OR 15) <> 63 was changed to be <> 47. In the Accounts Receivable System lines 2500 and 2970 also had the 63 changed to 47. The ARS Report Printing program had the 63 in lines 960 and 1660 changed to 47. Finally, the ARS End-of-Period processing had the 63 in line 1830 changed to a 47. The program appears to run fine now.

Leo B. Mc Cracken
Seattle, WA

As for your editorial on a more common BASIC (metalanguage) for all computers, may I say:

```
10 FOR X=1 TO 3
20 PRINT X; CHR$(32);"CHEERS"
30 NEXT X
40 PRINT
50 PRINT "To Basic Computing"
60 END
```

Paul Raymer
Las Vegas, NV

```
10 A$ = "Thanks!"
20 '
```

--Ed.

We own a TRS-80 Model II and are in the business of selling and renting video movies. We are looking for software for inventory control, individual customer transaction, hot rental titles, movies that have not been rented in quite some time, etc. We would like to know about any software that could be used by reading a bar code off the movie box.

Video Palace
255 Valley Blvd.
Wood-Ridge, NJ 07075
(201) 939-4460

Byte magazine ran a few articles on using bar codes with a TRS-80 Model I. The November 1983 issue of 80 Micro had routines for bar code reading and printing for the Model III. Perhaps your best bet is to use a Model 100 for the bar code reading and upload the data to the Model II. We are not familiar with any direct connections of a bar code wand to a Model II. Even after the data gets to the Model II you will probably still need to develop your own software to interpret it. --Ed.

Are you aware of anyone who has adapted Microsoft's Editor/Assembler Plus cassette version to run on the Model III and support disk I/O and the faster cassette I/O?

Tim Bowman
Spokane, WA

We haven't heard of one, perhaps a reader will let us know. --Ed.

I refer to your October, 1983 issue, page 92, on the advertising of adult video games. If this is the type of advertisements we have to look forward to in your magazine, I, personally - and hope many more - will cancel their subscriptions.

Bob Grove
Galveston, TX

Refer to advertiser index for reader service number

Ammicro introduces the first letter quality printer for $480 that can also be used as a typewriter.

The MICROWRITER™ Daisy wheel printer.

There was a need for a low cost letter quality machine that would be suitable for use as an office typewriter, and as a computer printer. Ammicro met that need by combining the Microwriter parallel interface and the traditional Olivetti craftsmanship that was available in their Praxis machine.

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It's not just printer or a typewriter that comes complete with a deluxe carrying case, but a feature-packed, lightweight machine that doubles as an office typewriter. This printer is a simple, low cost, reliable unit which can be utilized with word processing systems, microcomputers, personal computers, and small business systems. The Microwriter's low noise level and slim modern styling allow it to blend with any decor.

The Microwriter's print quality is identical to the finest office typewriters on the market. This machine is not only perfect for letters and manuscripts, but with it s 165 character, 12 inch print width, the machine is perfect for letter quality budget spread sheets, price lists, data sheets, and forms.

The Microwriter can tab, rule single lines both vertical and horizontally, underline and print at 10, 12, or 15 characters per inch (switch selectable)! Its ten character memory for automatic error correction, lift off correction ribbon, and fixed or programmable page formats are a few of the many features that make it a perfect office typewriter. Microwriter not only handles letter and legal size sheet paper in widths up to 12 inches wide, but also handles fanfold paper.

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Retirement planning

Computing a secure income

Models I/III/4/CC

Karl L. Townsend, Lansdale, PA

Retirement, for most of us, means no more alarm clocks, the end of time clocks, no more rushing to meetings; a time of easy living. It is also a time of no more paychecks! We will be living off the savings of our working years. A company pension and/or Social Security will usually make up the major part of the income to cover living expenses. The amounts payable under most of these plans can usually be determined by asking the local Social Security office or your company benefits department.

In addition, many prudent folks are building a "nest egg," invested in various ways, to supplement their other income sources when retired. In the case of a self-invested sum, determination of the monthly income is a little more difficult to achieve. Also a problem faced by the person looking at retirement is that of evaluating the size of the sum required to give the monthly supplement desired.

On retirement, how much of your "nest egg" can you withdraw for living each month? The ultra-conservatives among us will say "only the interest; you never touch your principal." But let's take a look at it realistically. For example, how long do you expect to live? This is by no means a facetious question. If you only utilize the interest from your savings, you will just be leaving the principal to someone else (with a share to the government) when you could have been enjoying it. You should be thinking of how to spread the payout of earnings and principal over your retirement years. However, the question remains; "How much can a person use of his principal each month and still not run out of money during retirement?" Also, how can you allow for the effects of inflation in your planning? Let's see if the computer can't help answer this for us.

The program shown in Listing 1 will attempt to provide some guidelines to assist in determining the use of your savings. Figure 1 shows a sample report based on an available savings of $25,000 invested at 10 per cent interest when beginning retirement. The left hand column is an ascending dollar withdrawal that might be made each month from the account. Beside each possible withdrawal amount is listed the number of years the money will last at the selected payout rate and the stated interest.

Column 3 provides an interesting number. A high inflation rate is a fact of life — and of retirement planning. The program has a built-in factor for increasing the withdrawal rate every 12 months in order to maintain a constant buying power. Since we can't be certain of future inflation rates, an approximation of six per cent compounded has been used. Column 3, therefore, shows the amount that will be withdrawn each month at the end of the period to retain the initial buying power. The figures may be shocking but they are something to be considered.

The fourth column shows the balance in the account when the last full withdrawal amount has been made.

Of course, the sample run shown is only valid for the principal and interest rate stated. You will have to enter your own nest egg amount and interest rate to see what the results will be for your own planning. Also, you may want to try varying interest rates to show their effect on the amount you can withdraw each month. This can aid you in deciding the type of investment best for you.

Another way to use the tabulation is make an assumption of the number of years that you will be withdrawing payments and find this number in column 2. Move to the left and you will see the amount you can pay yourself each month.

For the younger person trying to estimate his retirement needs and plan his savings program, running the program with varying principal amounts will show the size of the final fund required for the monthly payments desired.

An example of how to use this report might be as follows: "I am 65 years old, and based on family history, I can expect about 20 more years." Looking down column 2, the nearest figure to 20 years is 18.0. The column to the left shows that I can use $150 each month for this period (increased by inflation rate) before I run out of money.

Someone objects, "Look, you could withdraw the interest ($208), forever, and still have your principal." This is true, however, it does not take into account the factor of inflation. Note in column 3 where it shows that 18 years from now, it will take $428 to retain the same buying power. Looking at it the other way, the $208 interest will probably have a buying power of less than half what it had at the beginning of retirement.

Another way of looking at the chart might be to say "I need $300 per month along with my other income to live on. How long will my money last?" Looking to the right of a $300 withdrawal, it can be seen that the money will

Refer to advertiser index for reader service number

last just short of eight years. Better build up that nest egg!

Certain assumptions have been made in determining the parameters used in this program. One, already mentioned, is that of inflation. It has been set into the program as six per cent compounded yearly. This has the effect of increasing the withdrawal rate by six per cent each 12 months. Note that most retirement plans and annuities will pay a fixed sum periodically; thus in time of inflation, your buying power will gradually decrease. If you feel the rate built into the program needs modification, the factor can be changed in line 250. Tax approximations have also been built into the program. It is assumed that you will be paying income tax at the rate of 15 per cent when retired. This can also be modified to fit your situation by changing line 220.

It is further assumed that the first withdrawal will take place after the first month's interest has been added to the principal. This means the first payment can be taken during the second month of retirement. The program has been set to compound earned interest monthly. If this is not the case for your particular investment, line 220 will have to be modified to change the compounding period or remove it altogether.

Operation

The program is very simple and straight forward in its operation. On your keying in RUN, the program will display the title momentarily and then request several inputs from the operator. First, it will ask for the amount of the principal. Enter this as a single whole number without commas. It will then ask for the interest rate being earned on that money expressed as a decimal. Following these entries, the program will compute the output and print the report as seen in Figure 1.

Note that there will be pauses between print outputs to your printer. This is because a print line is formed and printed at the end of each computation involving a withdrawal amount and then the next line must be computed.

The title will be printed and the input parameters repeated at the top of the report for a permanent record of your entries. For general information, the simple interest (no compounding) earned on the principal is also shown. This is the amount that could be withdrawn from the account each month without reducing the principal. It is important to understand that this amount will stay fixed with no regard to inflation unless you make some change in the principal amount or in the interest rate paid. Therefore, it can be expected that the buying power of the interest paid will reduce over the years due to inflation. At current inflation rates, this means that it would buy about one-half the goods in 10 years that it can buy at the start of the period.

I hope that you will get some good information and ideas from this article but please remember that the information should only be used as a general guideline. There are a number of assumptions and computing methods that will render the results inexact. You can improve the accuracy of the results by fitting these assumptions to your own individual case, but it still cannot be considered an exact representation of your retirement finances. Happy Retirement!

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Figure 1

```
PRINCIPAL =  $25000    INTEREST RATE = .10    INTEREST/MONTH =   $208

        INITIAL                        FINAL
        PAYMENT      YEARS           PAYMENT      BALANCE

          $100        31.8             $609          $509
          $150        18.0             $428          $183
          $200        12.6             $402          $339
          $250         9.8             $422           $57
          $300         7.9             $451          $192
          $350         6.7             $496          $221
          $400         5.8             $535          $311
          $450         5.1             $602          $190
          $500         4.5             $631          $469
```

Sample run of program with a principal of $25,000 at an interest rate of 10 per cent.

Program Listing — Retirement Planning

```
10 REM RETIRE  T63  KARL L. TOWNSEND DEC
EMBER 81
20 DEFINT J
30 A$ = "$$####          ##.#       $$####
    $$######"
40 CLS: PRINT CHR$(23);
50 PRINT "RETIREMENT PLANNING"
60 FOR I = 1 TO 750: NEXT I: CLS
70 INPUT "ENTER PRINCIPAL AMOUNT.";PR
80 INPUT "ENTER INTEREST RATE AS A DECIM
AL.";IR
```

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Basic Computing	0 1 9 9 1 0 3 5	1 Oct 1983
3. FREQUENCY OF ISSUE: Monthly	3A. NO. OF ISSUES PUBLISHED ANNUALLY: 12	3B. ANNUAL SUBSCRIPTION PRICE: $19.97

4. COMPLETE MAILING ADDRESS OF KNOWN OFFICE OF PUBLICATION *(Street, City, County, State and ZIP Code) (Not printers)*
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5. COMPLETE MAILING ADDRESS OF THE HEADQUARTERS OF GENERAL BUSINESS OFFICES OF THE PUBLISHER *(Not printer)*
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PS Form 3526 *(See instruction on reverse)*

```
90 IN = IR/12
100 IE = PR*IN
110 IW = 50
120 FOR I = 1 TO 40
130 IF IW > (.5*IE) THEN I = 40: IW = IW
 - 100: GOTO 150
140 IW = IW + 50
150 NEXT I
160 GOSUB 350  'TO HEADING SUBOUTINE
170 FOR I = 1 TO 50
180 CLS
190 IW = IW + 50
200 W = IW: P1 = PR
210 FOR J = 1 TO 480
220 P1 = (P1*(1+(IN*.85))) - W  ' ALLOWS
 15 % TAX BITE
230 IF P1 < 0 THEN J = 480: P1 = P1 + W:
 GOTO 270
240 MO = J
250 IF INT(MO/12)*12 = MO THEN W = W*1.0
6  '6% INFLATION
260 PRINT @ J-1,"*";  'PACIFIER
270 NEXT J
280 YR = MO/12
290 IF YR => 40 THEN GOTO 320
300 LPRINTTAB(12) USING A$; IW,YR,W,P1
310 IF YR =< 5 THEN GOTO 340
320 NEXT I
330 LPRINT:LPRINT
340 END
350 LPRINTTAB(25);"RETIREMENT PLANNING"
360 LPRINT
370 LPRINTTAB(5);:LPRINT USING "PRINCIPA
L = $$######";PR;
380 LPRINTTAB(27);:LPRINT USING "INTERES
T RATE = .##";IR;
390 LPRINTTAB(49);:LPRINT USING "INTERES
T/MONTH = $$####";IE
400 LPRINT
410 LPRINT
420 LPRINTTAB(12); "INITIAL
      FINAL"
430 LPRINTTAB(12); "PAYMENT        YEARS
     PAYMENT      BALANCE"
440 LPRINT
450 RETURN
```

Color Computer Version

```
10 REM RETIRE  T63  KARL L. TOWNSEND DEC
EMBER 81
20 DIM A$(43)
30 A$ = "$$####          ##.#       $$####
    $$######"
40 CLS
50 PRINT "RETIREMENT PLANNING"
60 FOR I=1 TO 750:NEXT I:CLS
```


Refer to advertiser index for reader service number

```
70 INPUT "ENTER PRINCIPAL AMOUNT.";PR
80 INPUT "ENTER INTEREST RATE AS A DECIM
AL";IR
90 IN=IR/12
100 IE=PR*IN
110 IW=50
120 FOR I = 1 TO 40
130 IF IW>(.5*IE) THEN I = 40:IW = IW -
100:GOTO 150
140 IW = IW + 50
150 NEXT I
160 GOSUB 350 'TO HEADING ROUTINE
170 FOR I = 1 TO 50
180 CLS
190 IW = IW + 50
200 W = IW:P1 = PR
210 FOR J=1 TO 480
220 P1 = (P1*(1+(IN*.85))) - W ' ALLOWS
15 % TAX BITE
230 IF P1 < 0 THEN J = 480:P1 = P1 + W:
GOTO 270
240 MO = J
250 IF INT(MO/12)*12=MO THEN W = W*1.06
'6% INFLATION
260 PRINT @ J-1,"*"; 'PACIFIER
270 NEXT J
280 YR=MO/12
290 IF YR => 40 THEN GOTO 320
295 PRINT#-2,TAB(12);
300 PRINT#-2, USING A$ ;IW,YR,W,P1
310 IF YR =< 5 THEN GOTO 340
320 NEXT I
330 PRINT#-2:PRINT#-2
340 END
350 PRINT#-2,TAB(25)"RETIREMENT PLANNING
"
360 PRINT#-2
365 PRINT#-2,TAB(5);
370 PRINT#-2,USING "PRINCIPAL = $$#####"
;PR;
375 PRINT#-2,TAB(27);
380 PRINT#-2, USING "INTEREST RATE = .##
";IR;
385 PRINT#-2,TAB(49);
390 PRINT#-2, USING "INTEREST/MONTH = $$
####";IE
400 PRINT#-2
510 PRINT#-2
520 PRINT#-2,TAB(12) "INITIAL
      FINAL"
530 PRINT#-2,TAB(12)"PAYMENT        YEAR
    PAYMENT      BALANCE"
540 PRINT#-2
550 RETURN
```


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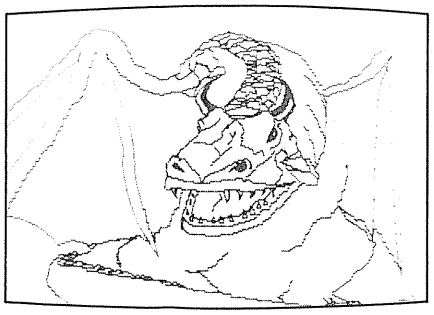

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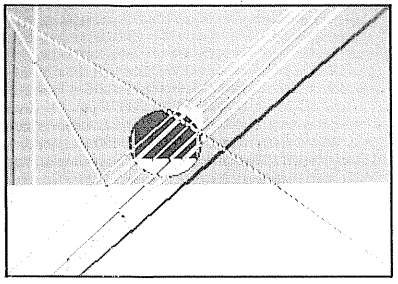

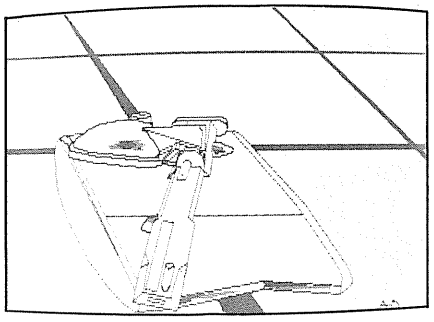

application. Businessmen and scientist can use DRAW to add text labels or other refinements to previously generated graphs. Once the picture is centered, labeled and refined, it can be saved on disk/tape or printed on any of 20 popular printers. All of this is done with single letter commands without ever leaving the DRAW program.

The Grafyx Solution package is shipped from stock and includes the board, 44 programs, and a 54 page manual all for $299.95. The DRAW program, twelve hi-res pictures, and manual is $39.95. Shipping is free on pre-paid or COD orders. (Tx. res. add 5% sales tax.)

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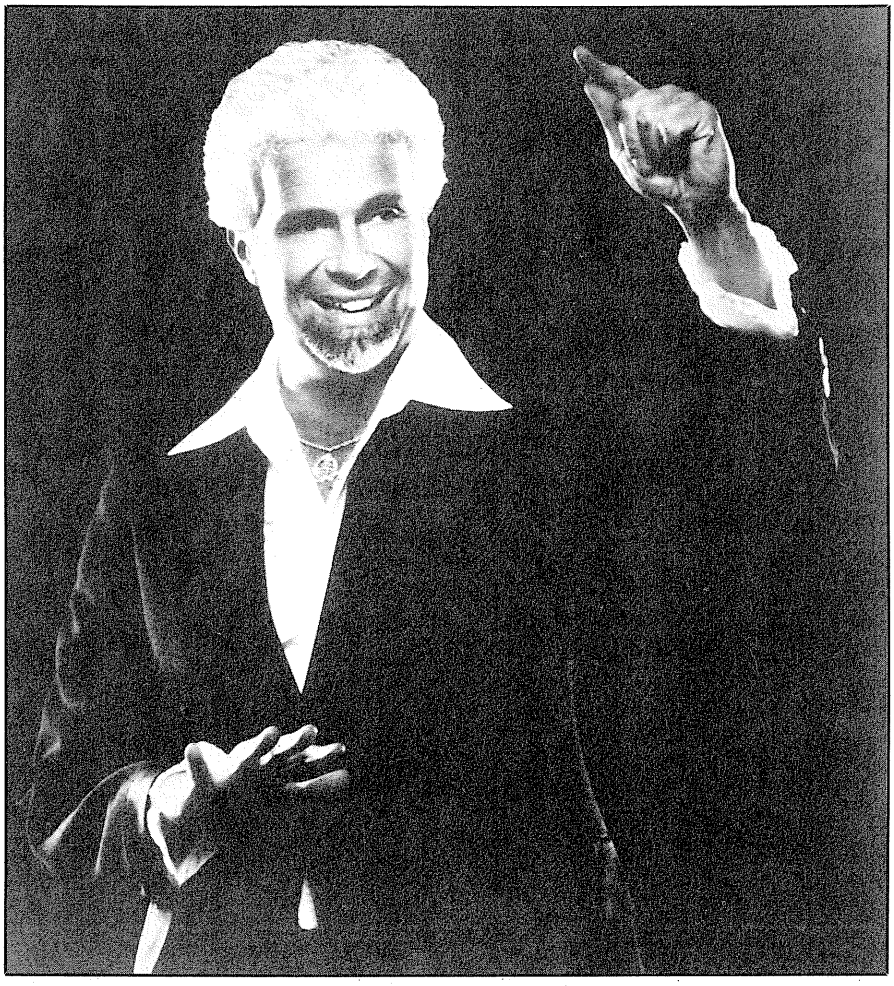
Basic Computing interviews Peter Nero

He can make computer keys harmonize as well as a piano's

For all readers

Harry Avant, La Crescenta, CA

I recently received a call from the editor of *Basic Computing* who asked if I had ever heard of Peter Nero. I told him that indeed I had. He is a very famous piano player. Next, the editor asked if I wanted to interview Peter Nero. I was told that Mr. Nero was an avid computer user and would be an interesting subject for an interview in *Basic Computing*. Well, I was relieved that I was not expected to interview him about music.



At this point, I really got excited. I was forming a mental picture of an all-expense paid trip to New York, maybe take in a show or two, and on and on. I asked what part of New York Peter Nero lived in. This was not my lucky day. I was told that the public relations group that represented him was in New York, but Nero lived in Los Angeles. It turned out my all-expense paid trip to interview Mr. Nero was a journey of twenty-five miles.

When I arrived at the Neros', I was met at the door by Mr. Nero. We went into his office/computer room, spent a couple of very pleasant hours discussing computers, software, the difficulties that occur when a person travels 180 or more days a year and even managed to spend a few minutes chatting about music.

Mr. Nero's home office is filled with telephones and Radio Shack computers and printers. I'm not sure how many telephone lines were in the room. I would guess at least seven. Wires and cables were in abundance. A Model I with four disk drives and a couple of printers was on one side of the room and a Model III with two more printers on the other side. Remember the pictures of Peter Nero in the Radio Shack catalogs, usually in the hi-fi section? Yes, he does use Radio Shack hi-fi equipment!

Why and how did you get involved with Radio Shack computers and why do you still use them?

I had seen a variety of people

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endorsing Radio Shack products, and I made up my mind that when I went down to the Dallas-Ft. Worth area I would contact Charles Tandy, in regard to having some type of association with them. During a two-week engagement at the Fairmont Hotel in Dallas, I called Charles Tandy. He suggested that the man I really wanted to talk to was Lewis E. Kornfeld, Jr., the president. So I called Mr. Kornfeld. Well, the resulting phone call began an association. Lou came to the hotel that night to hear my performance. Afterward, I invited him up to my suite. What I had in the suite was a small cassette recorder (this was in '76 or '77), a ten-watt amplifier and two speakers (the poly planar type). All of the equipment was Radio Shack's.

Lou was very impressed that it was their equipment. At that time, I spent "half of my life" in Radio Shack stores. My musicians really hassled me, because when we would be traveling and I would see a Radio Shack store, I would stop. I was always building kits while on the road. I used to carry one little case with nothing but tools (soldering iron, screwdrivers and so on). It seemed like a natural association. Radio Shack hired me as a consultant for their stereo equipment.

I started out with them in a relationship based on music. Then the rumors started going around that some companies were going to bring out microcomputers. One of the first to bring out a microcomputer was Commodore. I had been in touch with the Commodore people trying to get information about their computers. I was doing a record album in San Francisco. I placed a call to Commodore during a break in the recording session to try to find out when the micros were going to be available.

What did you want this microcomputer for?

Just the things I'm doing with it now — for its power, what it can do for my life: organize it.

So, even before they were available, you were aware of the potential?

Oh, yes. I have (and had) all of the electronics magazines, and I read them all. While I was trying to call Commodore, a Radio Shack engineer was sitting there. He asked me why I was calling Commodore, because Radio Shack was coming out with a microcomputer. I didn't know about it, so I called up my friends at Ft. Worth and they confirmed that it was going to be released in a few days. I went out and got a Radio Shack instead of the Commodore. That's how it started, with this one (the Model I). I think the serial number on this is number 26. Of course, everything has been upgraded, but it was done in steps. It has the new-style keyboard, 48K, serial port, four drives, everything. The modem is the 1200-baud one. I use it a lot, because it's so much faster."

What operating system (or systems) do you use?

I've always been with Tandy's operating systems. However, a friend of mine, who was teaching me BASIC, had his own operating system — one that he wrote himself, which was really a modification of NEWDOS. He gave me a copy of that and I used it on the Model I. For the Model III, I have LDOS, but haven't had much of a chance to work with it yet.

This whole thing is like Buck Rogers coming true.

When I look around this room, there's a tremendous collection of Radio Shack software. Is there anything you don't have? I don't see any games. Everything seems to be working programs. I see Profile, VisiCalc, Scripsit, Accounting, Time Manager . . .

No games. I use computers to solve problems that relate to business. I find programming and using the computers can be like a game, at least for me.

Which one of these do you use the most, the Model I or the Model III?

Well, I probably would have gotten rid of the Model I some time ago, except I'm so used to it. It's almost like a pet. The Model I churns away with its four drives, and it's slower than the Model III, but I wrote a lot of programs on it, and some of the programs have machine language parts that don't convert to the Model III. I've used this Model I a long time to get where I've gotten to. The Model III is used for bill paying programs and Joan, my secretary, is learning to do word processing on it. I've been afraid to let anybody get near that thing (the Model I) because when there are problems with the program, I know how to solve it, but I figure everyone else is going to blow it away and I'm going to get a phone call asking, "What do I do now?" Unfortunately, most software is not written to be user friendly, and you do have to know a little bit about what's going on to solve problems.

Why do you say that most software is not user friendly?

Because it's not. This Model 100 is the first example that is user friendly.

You're really impressed with the 100, aren't you?

Yes, and that's really true. It's a great step in the right direction. All of the programs are built-in. With most systems, you have to learn a new set of control characters for each application program. There is no standardization in cursor movement or backing up, and so on. That type of non-standardization is ridiculous. The information you need should be on the screen. Manuals should be ten pages long at most, not one hundred twenty. Some of the ads I see for software will say 120-page manual, exclamation mark. That turns me off. I don't want to read all of that.

Do you write a lot of your own programs?

Yes. For six or seven years, with a two-year hiatus in the middle.

What languages do you program in?

BASIC. I'm strictly an amateur. It's fun and I'm growing. I'm always on the phone calling up people I know, asking them to help me solve a programming problem. What's getting interesting is that there are some people that are calling me, asking me how to solve certain problems, and I can do it.

It must be a good feeling.

Yes, it is nice. It's nice to have another skill.

What's your view of computer-generated music?

I have no quibble with anybody

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Peter Nero

that does that. I have absolutely no interest in that whatsoever. I did have at one time, one of the first Moog synthesizers, and I realized that it is an instrument unto itself. It takes years and years of study and practice, and I just didn't have the time to devote to it, being out of town so often. After a few years I sold it. Since then I've had other synthesizers here, but I was trained on the piano and that is what I really want to perfect, so I stay with that.

There is one item like that which does interest me and that is the composer synthesizer, where the composer or arranger can sit down at the keyboard, and the thing works like a word processor, except in this case it's a note processor. It puts the notes on the screen, and you can transpose or change rhythmic values. That I can see, since it can save a lot of time for somebody that has to write fast, because whatever you play is going to be written down for you and printed out. That makes a lot of sense to me.

How effective is the office-on-the-road concept? Is it feasible to take a computer on the road?

Well, it wasn't feasible until the advent of this Model 100. What I used to do was use a portable data terminal and then I would hook in by telephone to the Model I or the Model III here. I would access my programs that way. Using telephone lines from a hotel room presents a few problems, and I don't like to leave these things on all the time. It was fun at the beginning, but I found I could write it down faster. Any material that had to be accessed from the computer could be done by my secretary.

What about using services such as The Source or CompuServe? Is that a feasible way to indirectly access your computer?

Yes, I can do that on the road. I can hook up to them, but with the advent of this 100, it's truly briefcase. Up until a few months ago, this book contained my life. It has sections in here for my manager, my accountant, a section on insurance, booking, and schedules.

It's hard to believe that your entire life was carried around in a three-ring binder. Have you ever encountered any resistance from the airlines about using the computer during flight?

Everybody's been asking that question lately. What that amounts to is that the answer is no, I haven't. When I first flew with it, stewardesses would pass by and ask, "What's that?" I'd show them, then the captain would come out and take a look at it. All they wanted to know was, what did it do and how did it work. They were fascinated by it. There was never any kind of problem about using it. One month later, a stewardess would pass by and say, "Oh, You've got one of those too?" The 100 has become very popular very quickly. I think the regulations came as a result of the electronic games being played and the noise disturbing other passengers.

So you're using the 100 as an electronic executive time-manager and notebook?

Somebody once described me as an industry. If I'm on the road for half of the year, that means negotiating about one hundred contracts and all of the details concomitant with that (travel, hotels, etc.). That's a lot of things to keep track of. I have a manager and I have two different agencies that take care of the bookings, a business manager and accountant in the same office. Over the last 23 years, I have found that the artist has to know everything that is going on, otherwise things have a tendency to slip.

I had a manager for twelve years and he was excellent. I learned the business from him. Time management is important because there are so many details to worry about that have nothing to do with playing the piano or conducting an orchestra or writing arrangements. For example, writing letters. It's a pleasure to sit here and dictate letters, but on an airplane I can't do that. What I do is to take out the Model 100, use the word processor and I can knock off a few letters. When I get to the hotel, I plug it in, call her (Joan, his secretary), she fires up the Model III and out come the letters.

I also carry with me a payroll program that I wrote. I have two musicians that travel with me and the accountant has to know all of the details: How many concerts did they

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play, how many days off, expenses, and so on. What used to happen when I'd get off the road was that I'd enter all of the information in my Model I and it would save me a lot of time compared to writing it down or calling up the secretary. That was fine, but it would all descend on me when I got home. So, I wrote a program for the 100 that does all of that, and I enter it as I go along. If I'm not home every two weeks, I just transmit it here and Joan sends it off to the accountant.

What would you like to have if you could have your ideal computer? Eighty-eight keys laid out in a line, some black and some white?

Well, I could handle that faster than I can program in BASIC. Right now, whenever they come out with something new, it's usually something that we didn't think was possible. This whole thing is like Buck Rogers coming true. The thing that I want is being tested now. I'm surprised that it hasn't caught on and been used more extensively. That is to use the computer to hook up to banks and shopping services, and so forth. It seems to be everywhere, but here in Los Angeles. I'm waiting for that to become a part of everyday life. The other thing I'm waiting for are really good interfaces to the computer that will run the house.

You already have a rather computerized home, don't you?

I'm going for it, but I have some problems left to solve. This house acts like it's on two transformers and prevents the BSR modules from working the way they should. The company is aware of the problem and they are providing some high-level help in solving it. Right now it takes two timers and command modules. Once the problem is solved, I'll write the necessary software to put all of the house under computer control. I'll probably use the Color Computer for that. That's the reason I bought it in the first place. The other thing that I have to add are more sensors, such as temperature, moisture and so on. There are also gadgets that have synthesized voice chips and gadgets that can monitor your home if you are away.

Have you thought about a more powerful computer?

The Model III is powerful enough. I have thought about going to the Model 4 for the better video display and 24 by 80 characters. The Model 100 is a powerful computer to me. Everything you need is in it. I store a lot of data on one forty-character line. I use a lot of my own code characters. When I upload to either the Model I or III, the lines are expanded. Sometimes the one line may become six or seven lines, without the shorthand coding.

Does your family share your enthusiasm about computers?

My wife is going to get started. I'm not sure if she will really relate to it. She is somewhat scared of it.

I've noticed that your typing is not standard touch-typing.

I use a hunt-and-peck system. I never did learn to type the correct way. I can hit whatever I want to. I look at the keys sometimes. In general, I don't hit the wrong keys very often.

Hitting the correct keys shouldn't be a surprise. You probably haven't hit the wrong key on a piano in twenty years.

I play piano a lot better than I type.

What, if anything, is wrong with the computer magazines? How could they be improved to be more useful to you?

Well, I hate those 3 by 5 cards that either fall out and onto the floor, or are bound in and keep the pages from laying flat. I would like to see programs in bar code, and bar code readers available. It is too much trouble to type in a long program from a magazine listing.

If you could do your computer experiences over, what would you do differently?

I would have worked twice as hard.

Can a person who travels a lot really learn to program while traveling?

Yes, because of all the "wasted time" that occurs during travel. The lap-type computers, such as this Model 100, are ideal, not only for business use on the road, but their portability makes them so easy to carry.

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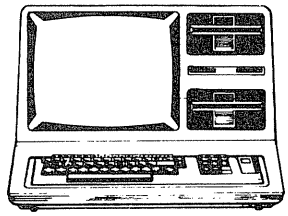

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Financial ratio analysis

Measuring your business's financial position

Models I/II/III/4/12/16

David P. Yon, CPA, Tallahassee, FL

How often have you wished there was a way to tell how well a particular company has performed in relation to other companies in its industry, or in relation to past performance? No doubt there have also been times when you wished you had a crystal ball and could determine how a company will perform in the future.

Although no one can predict the future, there are actions that can be taken to reduce the chance that future events will go in an unanticipated direction. One of these actions involves analyzing potential investments to be more certain that they will perform in accordance with expectations and investment goals. This is where financial ratio analysis is most useful.

Financial ratio analysis, or business financial evaluation, refers to the process of evaluating the financial information contained in the financial statements. This information is a measure of the financial position and results of operations of the business enterprise. The evaluation of this information can provide investors (or management) with meaningful information with which to compare current performance with either prior performance or the performance of other enterprises in the industry.

The financial ratio analysis program presented here is designed to provide the user with 18 ratios that can be utilized in measuring the performance of a business enterprise. In addition, a measure of short-term insolvency is included in the program. This program was developed on a Model III using TRSDOS. It requires approximately 17K of memory to run.

The inspiration for this program came from a program for financial ratio development that was developed by Cory Schou, Ronald Rubin and Jane Butt, all of the University of Central Florida. The measure of short-term insolvency ('Z' score) is available through the American Institute of Certified Public Accountants' Tymeshare and Comshare programs. The formula for calculating the 'Z' score has been modified for purposes of this program and is on line 7040. The modifications are the substitution of total equity for retained earnings, and book value of equity for market value of equity. This was done to facilitate the calculation of the ratios for smaller, closely-held companies. These substitutions should not significantly affect the calculation of the 'Z' score.

Financial Ratio Analysis and Individual Ratios

There are several manners in which financial ratios may be grouped. For purposes of this program, however, they have been classified into four general types, as shown in Table 1.

Table 1

Liquidity Ratios	**Activity Ratios**
Current Ratio	Cash Velocity
Quick Ratio	Inventory Turnover
Inventory to Working Capital	Fixed Assets Turnover
	Average Collection Period
Leverage Ratios	Total Assets Turnover
Debt to Total Assets	
Times Interest Earned	**Profitability Ratios**
Current Liabilities to Net Worth	Net Operating Margin
Fixed Assets to Net Worth	Net Income Margin
Debt to Equity	Return on Assets
	Return on Net Worth

An explanation of the four general types of ratios as well as the individual ratios are included in the program. The list of financial ratios is not all-inclusive. There are other ratios that are not included in this program that may be added to it by making appropriate changes and additions. When doing this, keep in mind that additional data input may be needed to calculate the added ratios.

Flowchart

The flowchart (Figure 1) depicts the logic of the program and presents the relationship of the routines and major subroutines as well as the various options that are available. The routines and major subroutines are described in Table 2. The applicable program line-numbers are shown in parentheses.

Input Data Needed

The information needed to calculate the ratios in this program is usually found in the financial statements of a company. These financial statements may be audited, reviewed, or compiled from the books and records of the company. Whatever the source of the financial information, care should be taken to ensure that it is the most reliable data available and is stated in a consistent basis from year to year (in order to preserve the comparability of the ratios calculated).

The financial information needed to provide the calculations of the ratios in this program is as follows:

Cash. Cash consists of all cash on hand plus cash in the company's bank accounts. Any cash in certificates

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of deposit or other short-term deposits should be included here.

Marketable Securities. This consists of investments in obligations that are readily marketable and can be converted into cash on short notice.

Receivables (beginning). Receivables are amounts that are due from customers for goods or services provided or rendered to them by the company. Receivables should be net of any reserve for doubtful accounts and be fully collectible within one year. Beginning receivables are those that were due to the company at the beginning of the operating year.

Receivables (ending). Ending receivables are those receivables due to the company at the end of the operating year.

Inventory (beginning). Inventory consists of those items of goods and merchandise that are owned by the company and held for sale to its customers. Beginning inventory is the inventory that is on hand at the beginning of the operating year.

Inventory (ending). Ending inventory is the inventory that is on hand at the end of the operating year.

Current Assets. This is the total of cash, marketable securities, receivables, inventories and other assets of the company that are expected to be converted into cash in the normal course of business within the current operating year.

Fixed Assets. These are assets such as land, buildings, leasehold improvements, equipment, fixtures, furnishings, vehicles and other assets with lives longer than one year that are used in the operations of the company.

Total Assets. Total assets are the total of all the assets of the company. These include current assets, fixed assets and other assets that are neither current or fixed.

Current Liabilities. Current liabilities are those debts of the company that must be paid within one year. These usually consist of trade accounts payable, payroll taxes withheld, accrued expenses and that portion of long-term debt coming due within one year.

Total Liabilities. This is the total of all the debt of the company and includes current as well as non-current liabilities.

Net Worth. Net worth (also called owner's equity or stockholders' equity) is the difference between total assets and total liabilities. This is the amount of funds that the owners have invested in the company plus earnings that have accumulated in prior years.

Sales. Sales are the total revenues earned by the company during the year. Sales should be net of all sales discounts and returns.

Gross Operating Profit. This is found by subtracting cost of sales from sales. It represents the difference between the sales price of all items sold and the cost of the items sold.

Interest Charges. Interest charges is the total amount of interest that has been paid by the company on its indebtedness.

Profit Before Income Taxes. Profit before taxes is the amount of income the company has earned before federal and state income taxes have been deducted.

Profit After Income Taxes. This is the net income of the company for the year after all expenses have been considered. It is commonly referred to as the "bottom line."

Because differences in terminology exist from industry to industry, care should be taken to ensure that the appropriate data is entered and is consistent with the above descriptions.

Table 2

Name and Date Input Subroutine (8000-8060). This subroutine allows the user to specify the company for which the financial analysis is being run as well as the date of the financial information which is used in analysis.

Definition of String Ratios (100-230). This section of the program assigns a string to each ratio name.

Main Menu Routine (9000-9260). This routine allows the user to select the option that is desired to be run. It also provides a test for the entry of financial information when such information has not previously been input.

Lead-in Information and Explanations of Ratio Types (1000-1420). This routine executes option A and provides a general explanation of financial ratios as well as the four general types of ratios included in the program.

Data Input Subroutine (3000-3360). This subroutine provides for the input of the financial data from which the ratios are calculated. There are provisions for checking the accuracy of input data.

Ratio Display and Selection Routine (2000-2980). This routine is available with option B and allows the user to select individual financial ratios for calculation and explanation.

Ratio Description Subroutines (5000-5655). Each ratio selected and calculated under option B utilizes a particular ratio description subroutine to explain the ratio and provide a general explanation whether the ratio is favorable or unfavorable.

Ratio Calculations Routine (4000-4230). This part of the program performs the calculations of the ratios.

Printout Option Subroutine (6000-6210). This subroutine gives the user the option of printing out a summary of all the ratios or having them displayed on the screen.

'Z' Score Calculation (7000-7110). This is available through option E. It calculates the short-term liquidity trend score which provides an indication of whether the company is likely to face financial difficulties in the near future.

This program contains operating instructions and can be run without reference to outside documentation. However, a brief explanation of how the program runs can help.

The first part of the program asks the user to provide the name of the company for which the ratio analysis is being performed and the date of the financial information. This is entered only once. If a ratio analysis is desired for another company, the program must be restarted.

The main menu displays the program options available and asks the user to make one of the following selections:

(A) Explanation of four general types of ratios.

(B) Calculation of ratios with individual explanations.

(C) Calculation of ratios without individual

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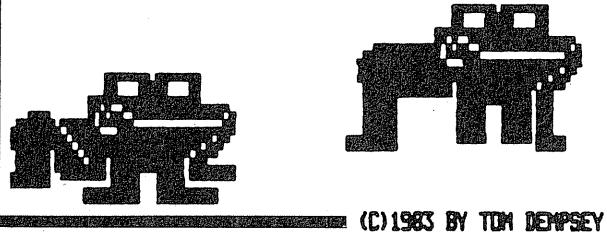

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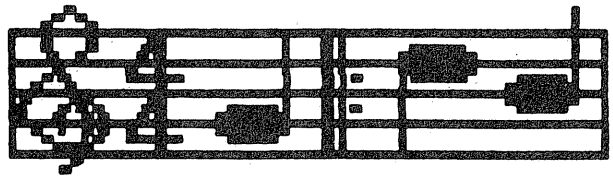

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Ratio analysis

explanations.

(D) Printout summary of all financial ratios.

(E) Printout of short-term liquidity trend ratio ('Z' score)

(F) Exit from program

Option A provides an explanation of what financial ratio analysis is about as well as an explanation of the four general types of ratios used in this program.

Option B gives a display of individual ratios calculated from the information input and provides an explanation of how the ratio is calculated as well as what the calculation may mean financially to the company.

Option C provides a calculation of all the ratios without the corresponding explanation of how the ratio is calculated and what it means.

Option D gives the user the option of having the ratios printed on a printer.

Option E displays the calculated 'Z' score for the company, which is a predictor of potential insolvency.

Table 3 — Program Variables

D= Data entry control number, used for data corrections.
I= Denotes ratio number corresponding to a selection letter.
X= Used in all FOR . . . NEXT loops.
Z= 'Z' score.
CT= Counter used to determine index to ratio types.
A1= Cash.
A2= Marketable securities.
A3= Beginning receivables.
A4= Ending receivables.
A5= Beginning inventory.
A6= Ending inventory.
A7= Current assets.
A8= Fixed assets.
A9= Total assets.
L1= Current liabilities.
L2= Total liabilities.
W1= Net worth.
S1= Sales.
S2= Gross operating profit.
E1= Interest charges.
P1= Profit before income taxes.
P2= Profit after income taxes.
R(number)= Corresponds to calculated ratio for a particular ratio number.
A$= Letter for the particular ratio desired.
B$= Y(es) or N(o) indicating whether entire data input is correct.
E$= Y(es) or N(o) indicating whether a printout of all ratios is desired.
G$= Letter for the main menu selection.
H$= Y(es) or N(o) indicating whether financial information has been entered.
I$= Name of company.
J$= Date of financial information.
K$= Y(es) or N(o) indicating whether individual input data items 1 through 9 have been entered correctly.
L$= Y(es) or N(o) indicating whether individual input data items 10 through 17 have been entered correctly.
R$(number)= Corresponds to ratio description for a particular ratio number.

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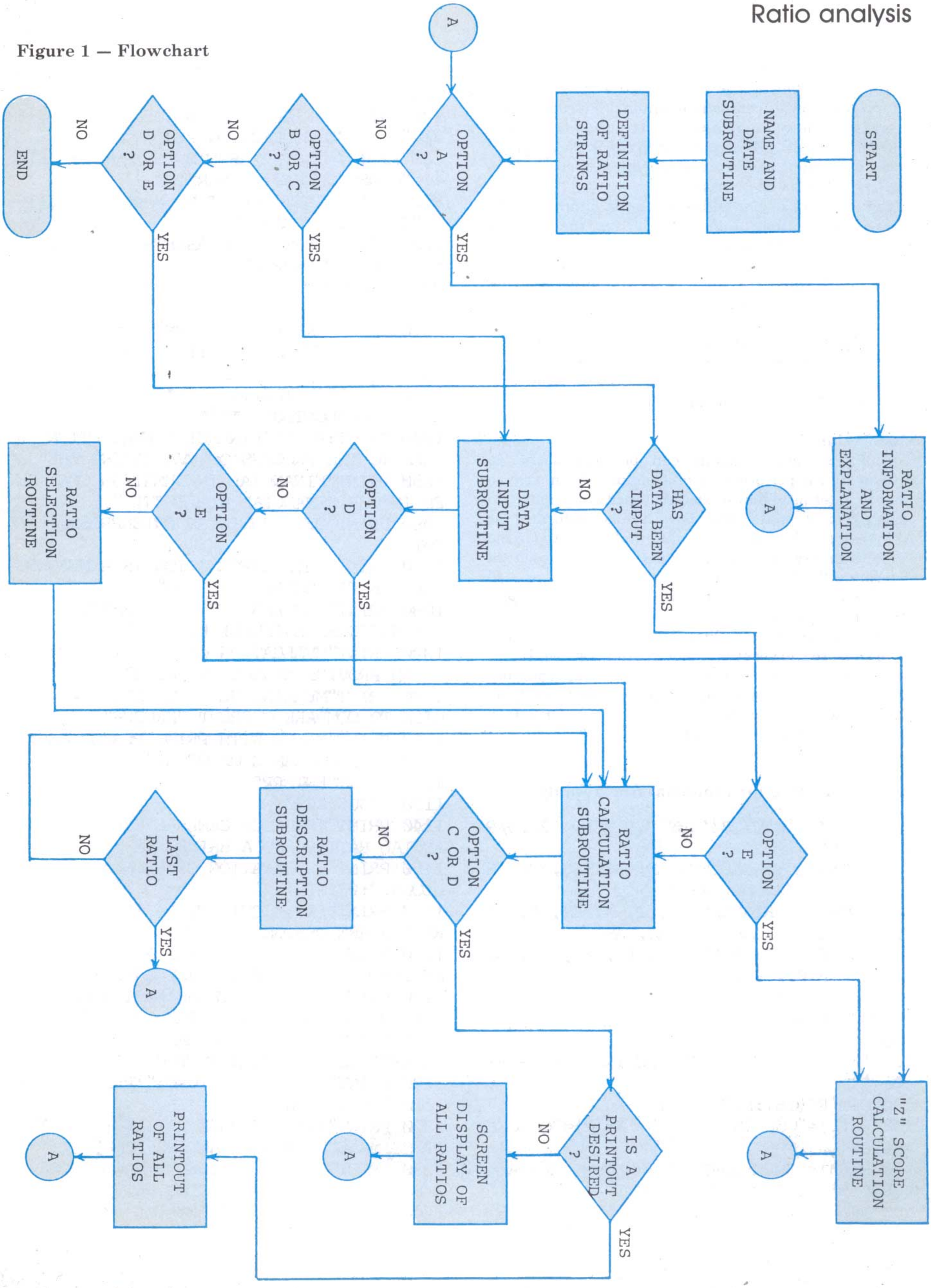
Figure 1 — Flowchart



Option F provides an exit from the program.

All options but A and F require that the financial information for the company be entered. The data input subroutine allows the financial information to be input into the program, allows the user to check the accuracy of the data input and provides for the correction of the data, should this be necessary.

The numbers in parentheses are the numbers to be entered when the program asks for the number corresponding to the incorrect data. After all corrections have been made, the program checks to see whether total assets equal the total of all liabilities and net worth. If these are not equal, the data must be checked and then re-entered.

Options D and E ask the user whether the financial information for the company has been entered. If it has, the program runs these options. If it has not, the data entry subroutine is run as previously described.

Conclusion

Financial ratio analysis can be very useful in measuring the performance of a company from year to year — in terms of how it has performed as compared to itself in past years, and how it has performed as compared to other companies of a similar size and in the same industry. Financial ratios are also used to determine the financial strength to self-insure, as well as by credit grantors to determine the credit worthiness of a potential borrower.

I have attempted to eliminate all of the "glitches" from this program, but may not have succeeded. If any user experiences difficulty with this program, or has any enhancements, I would appreciate hearing from them. You may write to me as follows: David P. Yon, CPA, P.O. Drawer 4108, Tallahassee, FL 32303.

Program Listing for Financial Ratio Analysis

```
10 '*****  'RATIOS4' BY D.P.YON, 12/26/8
2   *****
20 ' STRING VARIABLES: A$, B$, E$, G$, H
$, I$, J$, K$, L$, R$()
30 ' OTHER VARIABLES: D, I, X, CT, A1, A
2, A3, A4, A5, A6, A7, A8, A9
40 ' OTHER VARIABLES: L1, L2, W1, S1, S2
, E1, P1, P2, R()
50 Z$=" * * * "
60 GOSUB8030
100 '
110 ' -----RATIO STRING DEFINITIONS-----
120 '
130 DIM R$(18):DIM R(18)
140 R$(1)="CURRENT RATIO": R$(2)="QUICK
RATIO"
150 R$(3)="INVENTORY TO WORKING CAPITAL"
: R$(4)="DEBT TO TOTAL ASSETS"
160 R$(5)="TIMES INTEREST EARNED": R$(6)
="CURRENT LIABILITIES TO NET WORTH"
170 R$(7)="FIXED ASSETS TO NET WORTH": R
$(8)="DEBT TO NET WORTH"
180 R$(9)="CASH VELOCITY": R$(10)="INVEN
TORY TURNOVER"
190 R$(11)="FIXED ASSETS TURNOVER": R$(1
2)="AVERAGE COLLECTION PERIOD"
200 R$(13)="TOTAL ASSETS TURNOVER": R$(1
4)="GROSS OPERATING MARGIN"
210 R$(15)="NET OPERATING MARGIN": R$(16
)="NET INCOME MARGIN"
220 R$(17)="RETURN ON ASSETS": R$(18)="R
ETURN ON NET WORTH"
230 GOSUB9030
1000 '
1010 ' -----LEAD IN INFORMATION AND EXPL
ANATION OF TYPES OF RATIOS-----
1020 '
1030 CLS:PRINTTAB(11)"****  BUSINESS FIN
ANCIAL EVALUATION  ****"
1040 PRINT:PRINT"FINANCIAL EVALUATION RE
FERS TO THE PROCESS OF EVALUATING THE"
1050 PRINT"FINANCIAL INFORMATION CONTAIN
ED IN THE FINANCIAL STATEMENTS"
1060 PRINT"OF A BUSINESS ENTERPRISE.":PR
INT
1070 PRINT"THIS INFORMATION IS A MEASURE
 OF THE FINANCIAL POSITION"
1080 PRINT"AND RESULTS OF OPERATIONS OF
THE BUSINESS ENTERPRISE.  THE"
1090 PRINT"EVALUATION OF THIS INFORMATIO
N CAN PROVIDE MANAGEMENT WITH"
1100 PRINT"MEANINGFUL INFORMATION WITH W
HICH TO COMPARE CURRENT PERFOR-"
1110 PRINT"MANCE WITH PRIOR PERFORMANCE
OR THE PERFORMANCE OF OTHER"
1120 PRINT"ENTERPRISES."
1130 GOSUB 2430
1140 PRINT"THE FOUR GENERAL TYPES OF FIN
ANCIAL RATIOS AND A BRIEF"
1150 PRINT"EXPLANATION OF EACH ARE AS FO
LLOWS:":PRINT
1160 PRINT"(1) LIQUIDITY RATIOS - THESE
RATIOS ARE DESIGNED TO MEASURE A"
1170 PRINT"          FIRM'S ABILITY TO ME
ET ITS OBLIGATIONS AS THEY MATURE."
1180 PRINT"          THESE RATIOS RELATE
CURRENT OBLIGATIONS TO THE AMOUNT"
1190 PRINT"          OF CASH AND ASSETS C
ONVERTIBLE INTO CASH IN THE NEAR"
1200 PRINT"          FUTURE.":PRINT
1210 GOSUB 2430
1220 PRINT"(2) LEVERAGE RATIOS - THESE R
ATIOS MEASURE THE FINANCING PRO-"
1230 PRINT"          VIDED BY OWNERS AS C
OMPARED WITH THE FINANCING PROVID-"
1240 PRINT"          ED BY THE FIRM'S CRE
DITORS.  CREDITORS LOOK TO OWNER-"
1250 PRINT"          SUPPLIED FUNDS TO PR
OVIDE THEM WITH A MARGIN OF"
```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```
126Ø PRINT"          SAFETY.  HOWEVER, BY
 RAISING FUNDS THROUGH DEBT, THE""
127Ø PRINT"          OWNERS ARE ABLE TO M
AINTAIN CONTROL OF THE FIRM"
128Ø PRINT"          WITH A SMALL INVESTM
ENT.  THE RETURN TO THE OWNERS"
129Ø PRINT"          IS MAGNIFIED WHEN TH
E FIRM EARNS MORE ON THE BORROWED"
13ØØ PRINT"          FUNDS THAN IT PAYS I
N INTEREST.":PRINT
131Ø GOSUB 243Ø
132Ø PRINT"(3) ACTIVITY RATIOS - THESE R
ATIOS MEASURE HOW EFFECTIVELY"
133Ø PRINT"          THE FIRM IS UTILIZIN
G THE RESOURCES AT ITS COMMAND.":PRINT
134Ø GOSUB 243Ø
135Ø PRINT"(4) PROFITABILITY RATIOS - TH
ESE RATIOS SHOW THE RESULT OF THE"
136Ø PRINT"          POLICIES AND DECISIO
NS OF THE FIRM'S MANAGEMENT.  BOTH"
137Ø PRINT"          OPERATING MARGINS AN
D NET PROFITS ARE CALCULATED TO"
138Ø PRINT"          DISTINGUISH BETWEEN
THE RESULTS OF OPERATING POLICIES"
139Ø PRINT"          AND FINANCIAL POLICI
ES.":PRINT
14ØØ GOSUB243Ø
141Ø RETURN
142Ø GOSUB3Ø3Ø
2ØØØ '
2Ø1Ø ' -----RATIO SELECTION DISPLAY------
2Ø2Ø '
2Ø3Ø CLS:PRINT"INDEX TO LIQUIDITY RATIOS
:"
2Ø4Ø FOR X=1TO3:GOSUB 211Ø :NEXT X:GOSUB
 283Ø
2Ø5Ø CLS:PRINT"INDEX TO LEVERAGE RATIOS:
"
2Ø6Ø FOR X=4TO8:GOSUB 211Ø :NEXT X:GOSUB
 283Ø
2Ø7Ø CLS:PRINT"INDEX TO ACTIVITY RATIOS:
"
2Ø8Ø FOR X=9TO13:GOSUB 211Ø :NEXT X:GOSU
B 283Ø
2Ø9Ø CLS:PRINT"INDEX TO PROFITABILITY RA
TIOS:"
21ØØ FOR X=14TO18:GOSUB 211Ø :NEXT X:GOS
UB 283Ø
211Ø PRINTTAB(5) CHR$(X+64);". ";R$(X)
212Ø RETURN
24ØØ '
241Ø ' -----PAUSE SUBROUTINE-----
```


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```
2420 '
2430 PRINTTAB(30)"*** PRESS ANY KEY TO C
ONTINUE ***";
2440 IF INKEY$="" THEN 2440
2450 CLS:RETURN
2600 '
2610 ' -----RATIO EXPLANATION PRINT SUBR
OUTINE------
2620 '
2630 PRINT:PRINT"-----PRESS 'SHIFT', 'DO
WN ARROW' AND '*' FOR PRINTOUT---- OR --
"
2640 RETURN
2800 '
2810 ' -----RATIO SELECTION SUBROUTINE--
---
2820 '
2830 PRINT:PRINT"PRESS LETTER OF RATIO D
ESIRED."
2840 PRINT"IF NO RATIOS ARE DESIRED, PRE
SS 'Z'."
2850 A$=INKEY$:IF A$=""THEN 2850
2860 I=ASC(A$)-64
2870 IF I<1 THEN 2910
2880 IF I>26 THEN 2910
2890 IF I=26 THEN 2920 ELSE 2900
2900 IF I>18 THEN 2910 ELSE 2970
2910 PRINT:PRINT"**  INVALID LETTER, RE-
ENTER VALID LETTER **":GOTO 2830
2920 CT=CT+1:IF CT=1 THEN 2050
2930 IF CT=2 THEN 2070
2940 IF CT=3 THEN 2090
2950 IF CT=4 THEN 2960
2960 GOTO 9030
2970 ON I GOSUB 4030 ,4040 ,4050 ,4060 ,
4070 ,4080 ,4090 ,4100 ,4110 ,4120 ,4130
 ,4140 ,4150 ,4160 ,4170 ,4180 ,4190 ,42
00
2980 ON I GOTO 2030 ,2030 ,2050 ,2050 ,2
050 ,2050 ,2050 ,2070 ,2070 ,2070 ,2070
,2070 ,2090 ,2090 ,2090 ,2090 ,2090 ,903
0
3000 '
3010 ' -----DATA INPUT SUBROUTINE-----
3020 '
3030 CLS:B$="":PRINT"ENTER THE FOLLOWING
 FINANCIAL INFORMATION:"
3040 INPUT"    (1) CASH.....
.....";A1:IF B$="N" THEN 3170
3050 INPUT"    (2) MARKETABLE SECURITIES
.....";A2:IF B$="N" THEN 3170
3060 INPUT"    (3) RECEIVABLES- BEGINNIN
```


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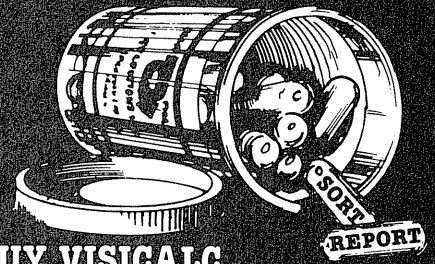

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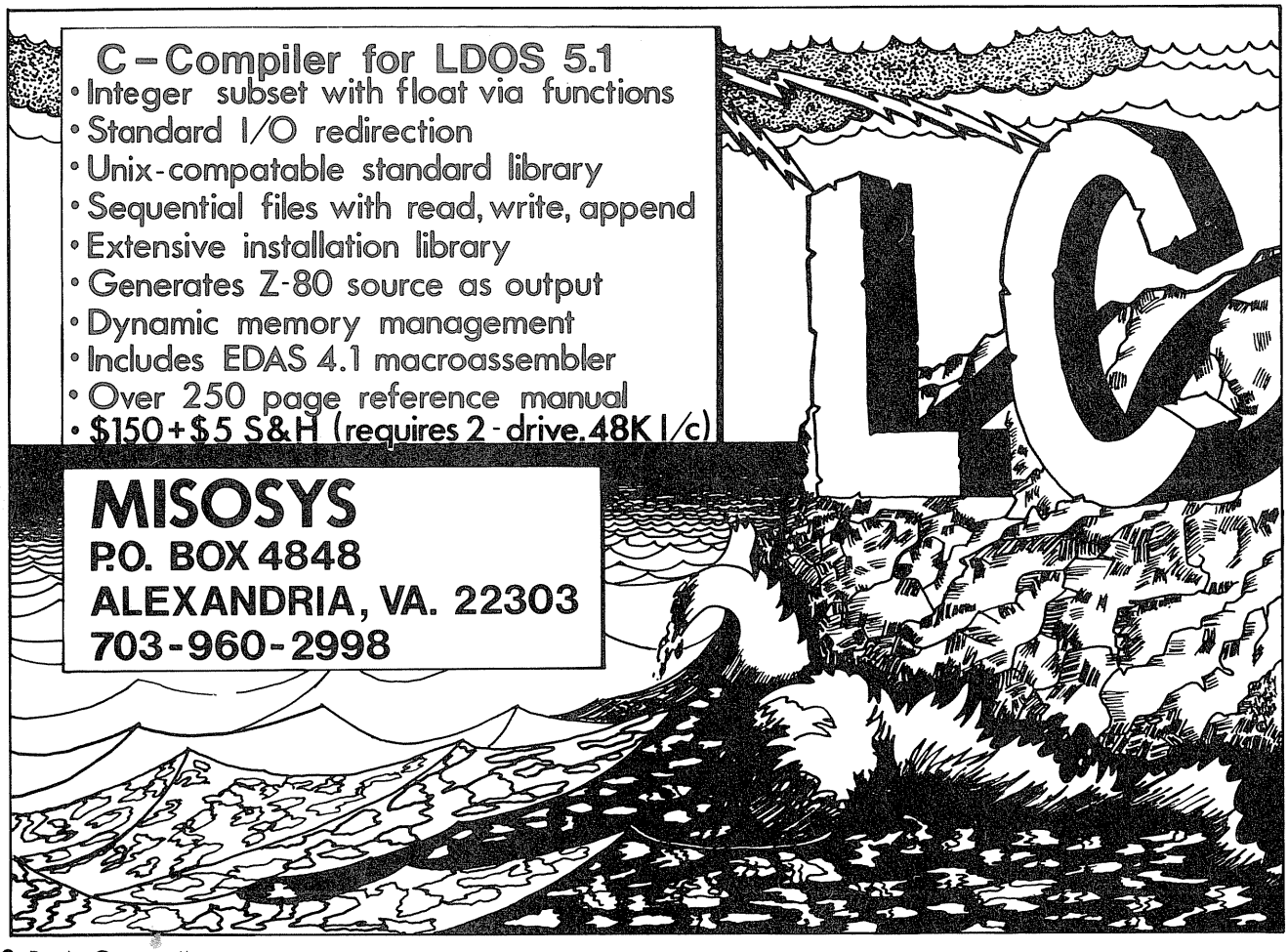
```
G.....";A3:IF B$="N" THEN 3170
3070 INPUT"     (4) RECEIVABLES- ENDING .
.....";A4:IF B$="N" THEN 3170
3080 INPUT"     (5) INVENTORY- BEGINNING.
.....";A5:IF B$="N" THEN 3170
3090 INPUT"     (6) INVENTORY- ENDING....
.....";A6:IF B$="N" THEN 3170
3100 INPUT"     (7) CURRENT ASSETS.......
.....";A7:IF B$="N" THEN 3170
3110 INPUT"     (8) FIXED ASSETS.........
.....";A8:IF B$="N" THEN 3170
3120 INPUT"     (9) TOTAL ASSETS.........
.....";A9:IF B$="N" THEN 3170
3130 INPUT"                  *** IS ALL THE
 ABOVE DATA CORRECT (Y/N)  ***";B$
3140 IF B$="Y" THEN 3180
3150 PRINT:INPUT"ENTER NUMBER CORRESPOND
ING TO INCORRECT DATA";D
3160 ON D GOTO 3040 ,3050 ,3060 ,3070 ,3
080 ,3090 ,3100 ,3110 ,3120
3170 INPUT"IS THIS ENTRY CORRECT (Y/N)";
K$:IF K$="N"THEN 3150 ELSE 3130
3180 CLS:B$="":PRINT"ENTER THE FOLLOWING
 FINANCIAL INFORMATION:"
3190 INPUT"     (10) CURRENT LIABILITIES.
.....";L1:IF B$="N" THEN 3310
3200 INPUT"     (11) TOTAL LIABILITIES...
.....";L2:IF B$="N" THEN 3310
3210 INPUT"     (12) NET WORTH..........
.....";W1:IF B$="N" THEN 3310
3220 INPUT"     (13) SALES..............
.....";S1:IF B$="N" THEN 3310
3230 INPUT"     (14) GROSS OPERATING PROF
IT.....";S2:IF B$="N" THEN 3310
3240 INPUT"     (15) INTEREST CHARGES....
.....";E1:IF B$="N" THEN 3310
3250 INPUT"     (16) PROFIT BEFORE INCOME
 TAXES....";P1:IF B$="N" THEN 3310
3260 INPUT"     (17) PROFIT AFTER INCOME
TAXES.....";P2:IF B$="N" THEN 3310
3270 INPUT"                  *** IS ALL THE
 ABOVE DATA CORRECT (Y/N)  ***";B$
3280 IF B$="Y" THEN 3320
3290 PRINT:INPUT"ENTER NUMBER CORRESPOND
ING TO INCORRECT DATA";D
3300 ON D GOTO 3040 ,3050 ,3060 ,3070 ,3
080 ,3090 ,3100 ,3110 ,3120 ,3190 ,3200
,3210 ,3220 ,3230 ,3240 ,3250 ,3260
3310 INPUT"IS THIS ENTRY CORRECT (Y/N)";
L$:IF L$="N"THEN 3290 ELSE 3270
3320 IF A9=L2+W1 THEN RETURN
3330 PRINT:PRINT"TOTAL ASSETS NOT EQUAL
```



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```
TO TOTAL LIABILITIES AND NET WORTH."
3340 PRINT"CHECK YOUR DATA FOR ACCURACY
THEN REENTER."
3350 GOSUB 2430
3360 GOTO 3030
4000 '
4010 ' -----RATIO CALCULATIONS-----
4020 '
4030 R(1)=INT(((A7/L1)*1000)+.5)/1000:IF
 G$="C" THEN 4040 ELSE 4210
4040 R(2)=INT(((A7-A6)/L1)*1000)+.5)/10
00:IF G$="C" THEN 4050 ELSE 4210
4050 R(3)=INT((A6/(A7-L1)))*1000+.5)/10
00:IF G$="C"THEN 4060 ELSE 4210
4060 R(4)=INT(((L2/A9)*1000)+.5)/1000:IF
 G$="C"THEN 4070 ELSE 4210
4070 R(5)=INT(((P1+E1)/E1)*1000)+.5)/10
00:IF G$="C"THEN 4080 ELSE 4210
4080 R(6)=INT(((L1/W1)*1000)+.5)/1000:IF
 G$="C"THEN 4090 ELSE 4210
4090 R(7)=INT((A8/W1)*1000)+.5)/1000:IF
 G$="C"THEN 4100 ELSE 4210
4100 R(8)=INT(((L2/W1)*1000)+.5)/1000:IF
 G$="C"THEN 4110 ELSE 4210
4110 R(9)=INT((S1/A1)*1000)+.5)/1000:IF
 G$="C"THEN 4120 ELSE 4210
4120 R(10)=INT(((S1-S2)/A6)*1000)+.5)/1
000:IF G$="C"THEN 4130 ELSE 4210
4130 R(11)=INT((S1/A8)*1000)+.5)/1000:I
F G$="C"THEN 4140 ELSE 4210
4140 R(12)=INT((A4/(S1/365))*1000)+.5)/
1000:IF G$="C"THEN 4150 ELSE 4210
4150 R(13)=INT((S1/A9)*1000)+.5)/1000:I
F G$="C"THEN 4160 ELSE 4210
4160 R(14)=INT((S2/S1)*1000)+.5)/1000:I
F G$="C"THEN 4170 ELSE 4210
4170 R(15)=INT((P1/S1)*1000)+.5)/1000:I
F G$="C"THEN 4180 ELSE 4210
4180 R(16)=INT((P2/S1)*1000)+.5)/1000:I
F G$="C"THEN 4190 ELSE 4210
4190 R(17)=INT((P2/A9)*1000)+.5)/1000:I
F G$="C"THEN 4200 ELSE 4210
4200 R(18)=INT((P2/W1)*1000)+.5)/1000:I
F G$="C"THEN 6030 ELSE 4210
4210 CLS:PRINT"THE ";R$(I);" IS ";R(I):P
RINT
4220 ON I GOSUB 5005 ,5045 ,5085 ,5120 ,
5155 ,5190 ,5235 ,5260 ,5300 ,5335 ,5370
 ,5400 ,5445 ,5480 ,5520 ,5550 ,5595 ,56
20
4230 RETURN
4240 '
```


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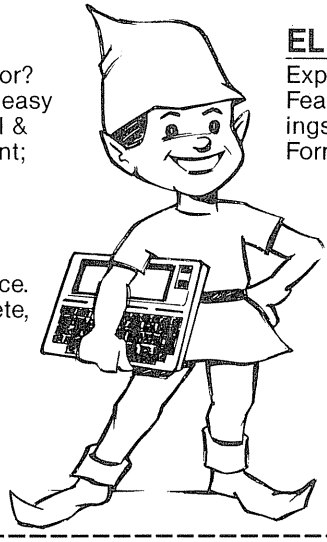

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```
4999 '
5000 ' -----RATIO DESCRIPTION SUBROUTINE
S-----
5001 '
5005 PRINT"THE CURRENT RATIO IS COMPUTED
 BY DIVIDING CURRENT LIABILITIES"
5010 PRINT"INTO CURRENT ASSETS.":PRINT
5015 PRINT"THIS RATIO IS THE GENERALLY A
CCEPTED MEASURE OF THE ABILITY"
5020 PRINT"TO SATISFY SHORT-TERM OBLIGAT
IONS.  IT INDICATES THE EXTENT"
5025 PRINT"TO WHICH THE CLAIMS OF SHORT-
TERM CREDITORS CAN BE COVERED BY"
5030 PRINT"ASSETS THAT ARE EXPECTED TO B
E CONVERTED TO CASH IN A PERIOD"
5035 PRINT"CORRESPONDING TO THE TIME THE
 OBLIGATIONS BECOME DUE."
5040 GOSUB 2630 :GOSUB 2430 :RETURN
5045 PRINT"THE QUICK RATIO IS CALCULATED
 BY DEDUCTING INVENTORIES FROM"
5050 PRINT"CURRENT ASSETS AND DIVIDING T
HE REMAINDER BY CURRENT LIAB-"
5055 PRINT"ILITIES.":PRINT
5060 PRINT"THIS RATIO IS A MEASURE OF TH
E ABILITY TO PAY SHORT-TERM"
5065 PRINT"OBLIGATIONS WITHOUT RELYING O
N THE SALE OF INVENTORIES.  IT"
5070 PRINT"IS A BETTER GUIDE TO SHORT-TE
RM LIQUIDITY THAN THE CURRENT"
5075 PRINT"RATIO."
5080 GOSUB 2630 :GOSUB 2430 :RETURN
5085 PRINT"THE INVENTORY TO WORKING CAPI
TAL RATIO IS CALCULATED BY"
5090 PRINT"DIVIDING WORKING CAPITAL INTO
 THE AMOUNT OF INVENTORY.":PRINT
5095 PRINT"THIS RATIO SHOWS THE PROPORTI
ON OF WORKING CAPITAL TIED UP IN"
5100 PRINT"INVENTORY.  IT IS USED TO IND
ICATE THE LOSS TO THE COMPANY"
5105 PRINT"THAT COULD RESULT FROM A DECL
INE IN INVENTORY VALUES.":PRINT
5110 PRINT"A LOW RATIO IS DESIRABLE."
5115 GOSUB 2630 :GOSUB 2430 :RETURN
5120 PRINT"THIS RATIO MEASURES THE COMPA
NY'S OBLIGATIONS TO CREDITORS"
5125 PRINT"IN RELATION TO ALL THE FUNDS
THAT HAVE BEEN PROVIDED TO THE"
5130 PRINT"COMPANY.":PRINT
5135 PRINT"THE LOWER THE RATIO, THE GREA
TER THE PROTECTION FROM LOSSES"
5140 PRINT"BEING INCURRED BY CREDITORS I
N THE EVENT OF LIQUIDATION.":PRINT
5145 PRINT"GENERALLY, THE MAXIMUM DEBT R
ATIO SHOULD BE 50 PERCENT."
5150 GOSUB 2630 :GOSUB 2430 :RETURN
5155 PRINT"THIS RATIO IS CALCULATED BY D
IVIDING EARNINGS BEFORE INTEREST"
5160 PRINT"AND TAXES BY INTEREST EXPENSE
.":PRINT
5165 PRINT"THIS IS A MEASURE OF THE EXTE
NT TO WHICH EARNINGS COULD FALL"
5170 PRINT"BEFORE THE COMPANY IS UNABLE
TO PAY ANNUAL INTEREST COSTS.":PRINT
5175 PRINT"THE LOWER THE RATIO, THE MORE
 DIFFICULTY THE COMPANY WILL"
5180 PRINT"HAVE IN RAISING ADDITIONAL FU
NDS."
5185 GOSUB 2630 :GOSUB 2430 :RETURN
5190 PRINT"THIS RATIO MEASURES THE AMOUN
T OF FUNDS SUPPLIED BY OWNERS"
5195 PRINT"COMPARED TO FUNDS PROVIDED BY
 CURRENT DEBT.":PRINT
5200 PRINT"IF OWNERS HAVE NOT PUT ENOUGH
 FUNDS INTO THE COMPANY,"
5205 PRINT"LONG-TERM CREDITORS WILL BE L
ESS WILLING TO PROVIDE FUNDS"
5210 PRINT"AND THE COMPANY WILL HAVE TO
UTILIZE SHORT-TERM FINANCING"
5215 PRINT"TO A GREATER EXTENT, WHICH WI
LL RESULT IN LONGER PERIODS OF"
5220 PRINT"TIME BEFORE CURRENT BILLS ARE
 PAID.":PRINT
5225 PRINT"THE LOWER THE RATIO, THE BETT
ER."
5230 GOSUB 2630 :GOSUB 2430 :RETURN
5235 PRINT"THIS RATIO INDICATES THE EXTE
NT TO WHICH OWNERS' FUNDS ARE"
5240 PRINT"INVESTED IN ASSETS WITH LITTL
E TURNOVER.  FOR THOSE INDUS-"
5245 PRINT"TRIES THAT ARE CAPITAL INTENS
IVE, A HIGHER RATIO WILL RESULT."
5250 PRINT"INDUSTRIES THAT ARE LABOR INT
ENSIVE WILL HAVE A LOWER RATIO."
5255 GOSUB 2630 :GOSUB 2430 :RETURN
5260 PRINT"THIS RATIO SHOWS THE RELATION
SHIP OF THE TOTAL DEBT OF THE"
5265 PRINT"FIRM TO FUNDS PROVIDED BY THE
 OWNERS.":PRINT
5270 PRINT"THE LOWER THE RATIO, THE GREA
TER THE PROTECTION AGAINST"
5275 PRINT"CREDITORS' LOSSES IN THE EVEN
T OF LIQUIDATION.  OWNERS MAY"
5280 PRINT"DESIRE A HIGH RATIO SINCE THI
S WILL MAGNIFY EARNINGS AND"
5285 PRINT"PREVENT POSSIBLE DILUTION OF
CONTROL OF THE COMPANY SHOULD"
5290 PRINT"ADDITIONAL EQUITY NEED TO BE
RAISED.
5295 GOSUB 2630 :GOSUB 2430 :RETURN
5300 PRINT"THE CASH VELOCITY RATIO IS ME
ASURED BY DIVIDING CASH"
5305 PRINT"AND CASH EQUIVALENTS INTO SAL
ES.":PRINT
5310 PRINT"THIS RATIO INDICATES THE NUMB
```


Refer to advertiser index for reader service number

CLONE I

CLONE III

Dear Customer!

If you care about TIME, you need Clone. Why did you buy your computer? If you are like us, you need your computer to save you time. You follow proper programming procedures and backup everything twice. THIS TAKES TIME! If you use more than one disk operating system, IT TAKES TIME. At the end of our programming day we have at least 8 disks to backup twice. With the disk backup utilities that came with our disk operating systems, formatting and verifying that many disks could take 64 minutes, not to mention the amount of time that it took to initialize and answer the opening inquiries for the various disk operating systems we use. Now we use the Clone duplication system and the entire process takes less than 23 minutes. Clone is so reliable at verifying that we never worry about having a bad duplication. We are sure you know that a disk which has not been properly verified might cause problems you would not detect for months. Clone is so advanced that passwords, densities or different disk operating systems don't affect its efficient operation. Clone is so flexible that we are also able to duplicate Atari 400, Atari 800, TRS-80 Color Computer as well as TRS-80 Model I, III, or IV disks. Clone is so sophisticated that if it encounters a damaged disk and is unable to read it, you can ask it to keep trying, take it's best guess, or give up. Most backup utilities just give up. Clone's error messages will explain exactly what the trouble is. Finally, Clone IS FAST! It takes just 1 minute 25 seconds to format, duplicate, and verify a disk that used to take us 4 minutes to complete.

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Sincerely,

James Schoengarth

James Schoengarth
Marketing Director
Gibberman Enterprises

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PEGASUS RESEARCH

```
ER OF TIMES CASH HAS TURNED"
5315 PRINT"OVER DURING THE YEAR.":PRINT
5320 PRINT"A HIGH CASH VELOCITY INDICATE
S THAT CASH IS BEING USED"
5325 PRINT"EFFECTIVELY."
5330 GOSUB 2630 :GOSUB 2430 :RETURN
5335 PRINT"INVENTORY TURNOVER IS CALCULA
TED BY DIVIDING COST OF SALES BY"
5340 PRINT"INVENTORY.":PRINT
5345 PRINT"THIS RATIO INDICATES THE LIQU
IDITY OF INVENTORY.  A HIGH"
5350 PRINT"INVENTORY TURNOVER MEANS THAT
 INVENTORIES ARE BEING HELD"
5355 PRINT"TO A MINIMUM.  A LOW RATIO MA
Y INDICATE OBSOLETE OR SLOW-"
5360 PRINT"MOVING STOCK."
5365 GOSUB 2630 :GOSUB 2430 :RETURN
5370 PRINT"FIXED ASSETS TURNOVER IS CALC
ULATED BY DIVIDING SALES BY"
5375 PRINT"FIXED ASSETS.":PRINT
5380 PRINT"THIS RATIO MEASURES THE UTILI
ZATION OF FIXED ASSETS.  A LOW"
5385 PRINT"RATIO MAY MEAN THAT PLANT IS
NOT BEING UTILIZED AS EFFECTIVELY"
5390 PRINT"AS POSSIBLE, UNLESS THE COMPA
NY IS LABOR INTENSIVE."
5395 GOSUB 2630 :GOSUB 2430 :RETURN
5400 PRINT"THE AVERAGE COLLECTION PERIOD
 IS CALCULATED BY DIVIDING"
5405 PRINT"ACCOUNTS RECEIVABLE BY AVERAG
E DAILY SALES.":PRINT
5410 PRINT"THIS RATIO REPRESENTS THE AVE
RAGE LENGTH OF TIME THAT"
5415 PRINT"PASSES AFTER MAKING A SALE BE
FORE CASH IS RECEIVED.":PRINT
5420 PRINT"THE TREND OF THIS RATIO GIVES
 AN INDICATION OF THE EFF-"
5425 PRINT"ECTIVENESS OF CREDIT AND COLL
ECTION POLICIES.  A RISING"
5430 PRINT"RATIO INDICATES THAT THESE PO
LICIES MAY NEED TO BE"
5435 PRINT"STRENGTHENED."
5440 GOSUB 2630 :GOSUB 2430 :RETURN
5445 PRINT"TOTAL ASSETS TURNOVER IS COMP
UTED BY DIVIDING SALES BY"
5450 PRINT"TOTAL ASSETS.":PRINT
5455 PRINT"THIS RATIO INDICATES THE EFFI
CIENCY WITH WHICH THE FIRM"
5460 PRINT"UTILIZES ITS RESOURCES IN ORD
ER TO GENERATE SALES. A HIGH"
5465 PRINT"RATIO MAY INDICATE OVERUTILIZ
ATION OF ASSETS; A LOW RATIO"
5470 PRINT"MAY INDICATE EXCESSIVE INVEST
MENTS AND OR IDLE ASSETS."
5475 GOSUB 2630 :GOSUB 2430 :RETURN
5480 PRINT"THE GROSS OPERATING MARGIN RA
TIO IS GROSS OPERATING PROFIT"
5485 PRINT"DIVIDED BY SALES.":PRINT
5490 PRINT"THIS RATIO INDICATES THE DEGR
EE TO WHICH UNIT SELLING PRICES"
5495 PRINT"MAY DECLINE WITHOUT RESULTING
 IN A LOSS FROM THE SALE OF THE"
5500 PRINT"UNITS.  IT ALSO INDICATES HOW
 PRODUCTS ARE PRICED IN RELATION"
5505 PRINT"TO THEIR COST."
5510 GOSUB 2630 :GOSUB 2430 :RETURN
5515 RETURN
5520 PRINT"THE NET OPERATING MARGIN IS P
ROFIT BVEFORE TAXES DIVIDED BY"
5525 PRINT"SALES.":PRINT
5530 PRINT"THIS RATIO INDICATES THE AMOU
NT THAT EACH SALES DOLLAR"
5535 PRINT"PROVIDES TO THE CONTINUING OP
ERATION OF THE FIRM BEFORE"
5540 PRINT"CONSIDERING INCOME TAXES."
5545 GOSUB 2630 :GOSUB 2430 :RETURN
5550 PRINT"THE NET INCOME MARGIN IS CALC
ULATED BY DIVIDING NET PROFITS"
5555 PRINT"AFTER TAXES BY SALES.":PRINT
5560 PRINT"A LOWER MARGIN INDICATES THAT
 THE FIRM'S SELLING PRICES"
5565 PRINT"ARE RELATIVELY LOW AND ITS TO
TAL COSTS ARE RELATIVELY HIGH."
5570 PRINT"THIS MEANS THAT A SMALL PERCE
NTAGE DROP IN SALES MAY RESULT"
5575 PRINT"IN LOSSES.  THIS RATIO PROVID
ES AN INDICATION OF THE PROFIT-"
5580 PRINT"ABILITY OF THE FIRM AFTER TAK
ING INTO ACCOUNT ALL EXPENSES"
5585 PRINT"AND INCOME TAXES, AND MEASURE
S THE RATE OF RETURN ON SALES."
5590 GOSUB 2630 :GOSUB 2430 :RETURN
5595 PRINT"THE RETURN ON ASSETS RATIO IS
 CALCULATED BY DIVIDING"
5600 PRINT"NET PROFITS AFTER TAXES BY TO
TAL ASSETS.":PRINT
5605 PRINT"THIS RATIO MEASURES THE FIRM'
S RATE OF RETURN ON ITS TOTAL"
5610 PRINT"RESOURCES."
5615 GOSUB 2630 :GOSUB 2430 :RETURN
5620 PRINT"THE RETURN ON NET WORTH RATIO
 IS CALCULATED BY DIVIDING"
5625 PRINT"NET PROFIT AFTER TAXES BY NET
 WORTH.":PRINT
5630 PRINT"THIS RATIO MEASURES THE PRODU
CTIVITY OF THE RESOURCES THE"
5635 PRINT"OWNERS OF THE FIRM HAVE COMMI
TTED TO THE OPERATION OF THE"
5640 PRINT"BUSINESS.  IT CAN BE USED BY
OWNERS IN DETERMINING WHETHER"
5645 PRINT"THEIR INVESTMENT IN THIS FIRM
 HAS PERFORMED BETTER THAN"
5650 PRINT"OTHER POTENTIAL INVESTMENTS."
5655 GOSUB 2630 :GOSUB 2430 :RETURN
```


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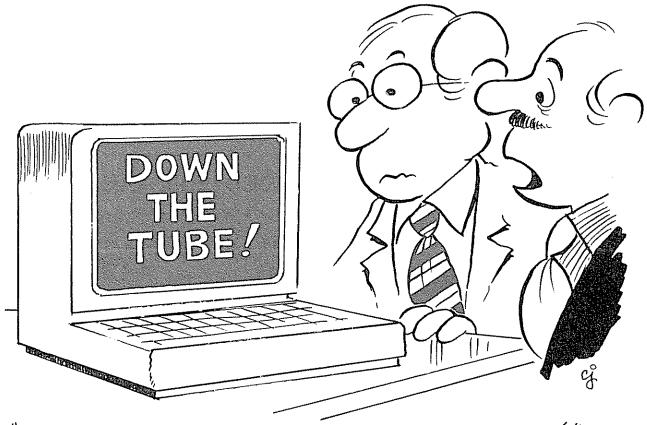
```
6000 '
6010 ' -----PRINTOUT OPTION SUBROUTINE--
---
6020 '
6030 CLS:PRINT:INPUT"IS A PRINTOUT OF TH
E SUMMARY DESIRED (Y/N)";E$
6040 IF E$="N" THEN 6110
6050 LPRINT I$:LPRINT
6060 LPRINT"SUMMARY OF FINANCIAL RATIOS
AS OF ";J$:LPRINT
6070 FOR X=1 TO 18
6080 LPRINTTAB(5)R$(X);TAB(42)R(X)
6090 NEXT X
6100 GOTO 9030
6110 CLS:PRINT"SUMMARY OF FINANCIAL RATI
OS:":PRINT
6120 FOR X=1 TO 8
6130 PRINTTAB(5)R$(X);TAB(45)R(X)
6140 NEXT X
6150 PRINT:PRINTTAB(20)"*** PRESS ANY KE
Y FOR ADDITIONAL RATIOS ***"
6160 IF INKEY$="" THEN 6160
6170 CLS:PRINT"ADDITIONAL FINANCIAL RATI
OS:":PRINT
6180 FOR X=9 TO 18
6190 PRINTTAB(5)R$(X);TAB(45)R(X)
6200 NEXT X
6210 PRINT:GOSUB 2430 :GOTO 9030
7000 '
7010 ' -----'Z' SCORE CALCULATION-----
7020 '
7030 CLS:PRINT"SHORT-TERM LIQUIDITY TREN
D RATIO ('Z' SCORE):":PRINT
7040 Z=.012*((A7-L1)/A9)+.014*(W1/A9)+.0
33*((P1+E1)/A9)+.006*(W1/L2)+.999*(S1/A9
)
7050 PRINT"THE Z SCORE IS: ";Z:PRINT
7060 PRINT"A 'Z' SCORE GREATER THAN 3 HA
S LITTLE STATISTICAL SIGNIFICANCE.":PRIN
T
7070 PRINT"A 'Z' SCORE LESS THAN 1.8 IS
A FAIRLY RELIABLE PREDICTOR OF"
7080 PRINT"BANKRUPTCY OR INSOLVENCY WITH
IN TWO YEARS.  A SCORE BETWEEN"
7090 PRINT"1.8 AND 3 INDICATES POTENTIAL
 INSOLVENCY OR BANKRUPTCY AND"
7100 PRINT"SHOULD SERVE AS A WARNING FLA
G.":PRINT
7110 GOSUB 2630 :GOSUB 2430 :GOTO 9030
8000 '
8010 ' -----NAME AND DATE INPUT-----
8020 '
8030 CLS:PRINTTAB(11)"****  BUSINESS FIN
ANCIAL EVALUATION  ****":PRINT
8040 LINEINPUT"ENTER NAME OF BUSINESS: "
;I$
8050 LINEINPUT"ENTER DATE OF FINANCIAL I
NFORMATION: ";J$
8060 RETURN
9000 '
9010 ' -----MAIN MENU-----
9020 '
9030 CLS:PRINTTAB(11)"****  BUSINESS FIN
ANCIAL EVALUATION  ****":PRINT
9040 PRINT"ENTER FUNCTION DESIRED:":PRIN
T
9050 PRINTTAB(5)"(A) EXPLANATION OF FOUR
 GENERAL TYPES OF RATIOS"
9060 PRINTTAB(5)"(B) CALCULATION OF RATI
OS WITH INDIVIDUAL EXPLANATIONS"
9070 PRINTTAB(5)"(C) CALCULATION OF RATI
OS WITHOUT INDIVIDUAL EXPLANATIONS"
9080 PRINTTAB(5)"(D) PRINTOUT SUMMARY OF
 ALL FINANCIAL RATIOS"
9090 PRINTTAB(5)"(E) PRINTOUT OF SHORT-T
ERM LIQUIDITY TREND RATIO (Z SCORE)"
9100 PRINTTAB(5)"(F) EXIT FROM PROGRAM"
9110 PRINT:PRINTTAB(30)"*** PRESS APPROP
RIATE LETTER ***"
9120 G$=INKEY$:IF G$=""THEN 9120
9130 IF G$="A" THEN GOSUB 1030 :GOTO 903
0
9140 IF G$="B" THEN GOSUB 3030 :GOTO 203
0
9150 IF G$="C" THEN GOSUB 3030 :GOTO 403
0
9160 IF G$="D" THEN 9190
9170 IF G$="E" THEN 9190
9180 IF G$="F" THEN END
9190 PRINT:INPUT"HAVE YOU ENTERED THE FI
NANCIAL INFORMATION (Y/N)?";H$
9200 IF H$="Y"THEN 9220
9210 IF H$="N"THEN 9240
9220 IF G$="E" THEN 7030
9230 G$="C":GOTO 4030
9240 PRINT"** FINANCIAL INFORMATION MUST
 BE ENTERED FIRST **":PRINT
9250 GOSUB 2430 :GOSUB 3030
9260 IF G$="E" THEN 7030 :ELSE 4030
```



"I ASKED FOR A READ-OUT OF OUR FOURTH QUARTER."

What is your real income?

Using VisiCalc to find out

Models I/II/III/4/12/16

David R. Pepple, Bexley, OH

In these times of high inflation, it is critical to understand the impact that eroding purchasing power may have upon our finances. In 1980, American business began to account for this impact by adopting a concept practiced in Europe for some years. This practice consists of adjusting the historical accounting data to reflect the purchasing power of the dollar in the specific period when the transactions took place. The method uses a price index to reflect the relative purchasing power and calculates a conversion factor by comparing the index in a specific period to the index value in a base period. This concept can easily be applied by the individual to see how he is faring in these turbulent times.

A quick and flexible way to do this, while avoiding the time-consuming process of developing a program, is to use VisiCalc. To develop the analysis, you will need two items, the Consumer Price Index for the periods under study and your income figures. I suggest the use of the Consumer Price Index since it is readily available and generally considered to be a reasonable measure of inflation within the U.S. economy. It should be noted that any index values can be used due to the manner in which the spreadsheet has been constructed and it is very easy to change the index values and see the resulting effects on your earnings.

Figure 1 is the resulting spreadsheet including the reference letters for columns and the numbers for

Figure 1

	A	B	C	D	E
01	PRICE LEVEL ADJUSTMENT WORKSHEET				
02					
03	BASE YR	1978	195.3		
04					
05		1978	1979	1980	1981
06	CPI VALUE	195.3	217.7	247	274.4
07	CONV. FAC	1	.8971061	.7906883	.7117347
08					
09	HISTORICAL INCOME				
10					
11	SALARY-D	25000	29000	31000	34000
12	INTEREST	600	500	800	
13	INVEST		2500		3000
14	OTHER		-1090	-551	
15	GROSS INC	25600	30910	31249	37000
16					
17	PRICE-LEVEL ADJUSTED INCOME				
18					
19	SALARY-D	25000	26016	24511	24199
20	INTEREST	600	449	633	0
21	INVEST	0	2243	0	2135
22	OTHER	0	-978	-436	0
23	GROSS INC	25600	27730	24708	26334
24					

Refer to advertiser index for reader service number

rows. Throughout this narrative, I will refer to the reference letters and numbers when describing contents or formulas.

The steps to producing the sheet are as follow:

1. After you have loaded VisiCalc, begin by issuing the global format command and setting all numeric fields to integer.

2. Enter the title in row 1 by typing each part into a column. Note that it is necessary to type only nine characters into each column since that is the default value on column size.

3. Using the repeating command, enter the dashes shown on line 2 in column A and then replicate in columns B through E.

4. In row 3, type the title into column A and enter the year which you will use as base in column B. The Consumer Price Index value for the base year should be entered into column C of row 3.

5. Replicate row 2 onto row 4 so that you have a separator between the base year information and the full-time series of consumer price level index values.

6. On row 5, beginning in column B, enter the first year which you wish to adjust. In column C, type the formula +B1+1 and then replicate in columns D through E using the relative option so that each year is one greater than the previous.

7. On row 6, enter the title of the index in column A and then the appropriate values in columns B through E.

8. On row 7, enter the abbreviated title "CONV.FAC" for conversion factor in column A and the formula +C3/B6 in column B. You should set the format of column B to be general so that the full decimal values will be shown on your printout. Replicate the formula in column B into columns C through E using the non-relative option for the first term of the equation and the relative option for the second term. The result of this will be a formula in column C of +C3/C6 and in column D of +C3/D6, etc.

9. Replicate row 2 into row 8.

10. Type the title into row 9 and replicate row 2 into row 10.

11. Enter the title of the income source into column A of row 11 and enter the amounts earned in each year in the appropriate column. Do the same thing for each type of income you wish to analyze. In the example, these are entered in rows 12 through 14.

12. In row 15, enter the title of the total of all income into column A and the formula @SUM (B11 . . . B14) into column B. Replicate the formula into columns C through E using the relative option.

13. In row 16, replicate row 2 and in row 17, type the title for the price level adjusted income and then replicate row 2 into row 18.

14. In row 19, column A, type the title for the first income component the same as typed on line 11. In column B, type the formula +B11*B7 then replicate the formula into columns C through E using the relative option.

15. In rows 20 through 22, do the same as above using the appropriate row from the historical income section of the sheet.

16. In row 23, use the SUM command to total rows 19 through 22 to provide the totals for the price level adjusted income components.

17. In row 24, replicate row 2 to finish the sheet.

Once the basic worksheet has been entered, it becomes very easy to evaluate the impact of using new base years by merely inserting the new year and index value in cell B3 and C3. This allows you to restate income in terms of the purchasing power of a specific year with great ease. It is also easy to add new data by merely adding a new column to the worksheet. By storing this worksheet to disk and updating each year at income tax time, it will be very easy to see how you are doing in relation to inflation in the economy as a whole. Another great feature is the ability to use a substitute index very easily by replacing row 3 and row 6 and, of course, VisiCalc will take care of all the rest.

Needless to say, this is merely a short sample of how VisiCalc can be used to analyze personal finances in a quick, thorough manner. Now that you understand the impact of inflation on your income, all you have to do is get your boss to understand and do something about it!!

VisiCalc is a registered trademark of VisiCorp, Inc.

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Model 100 up- and downloading

Techniques to use with mainframes

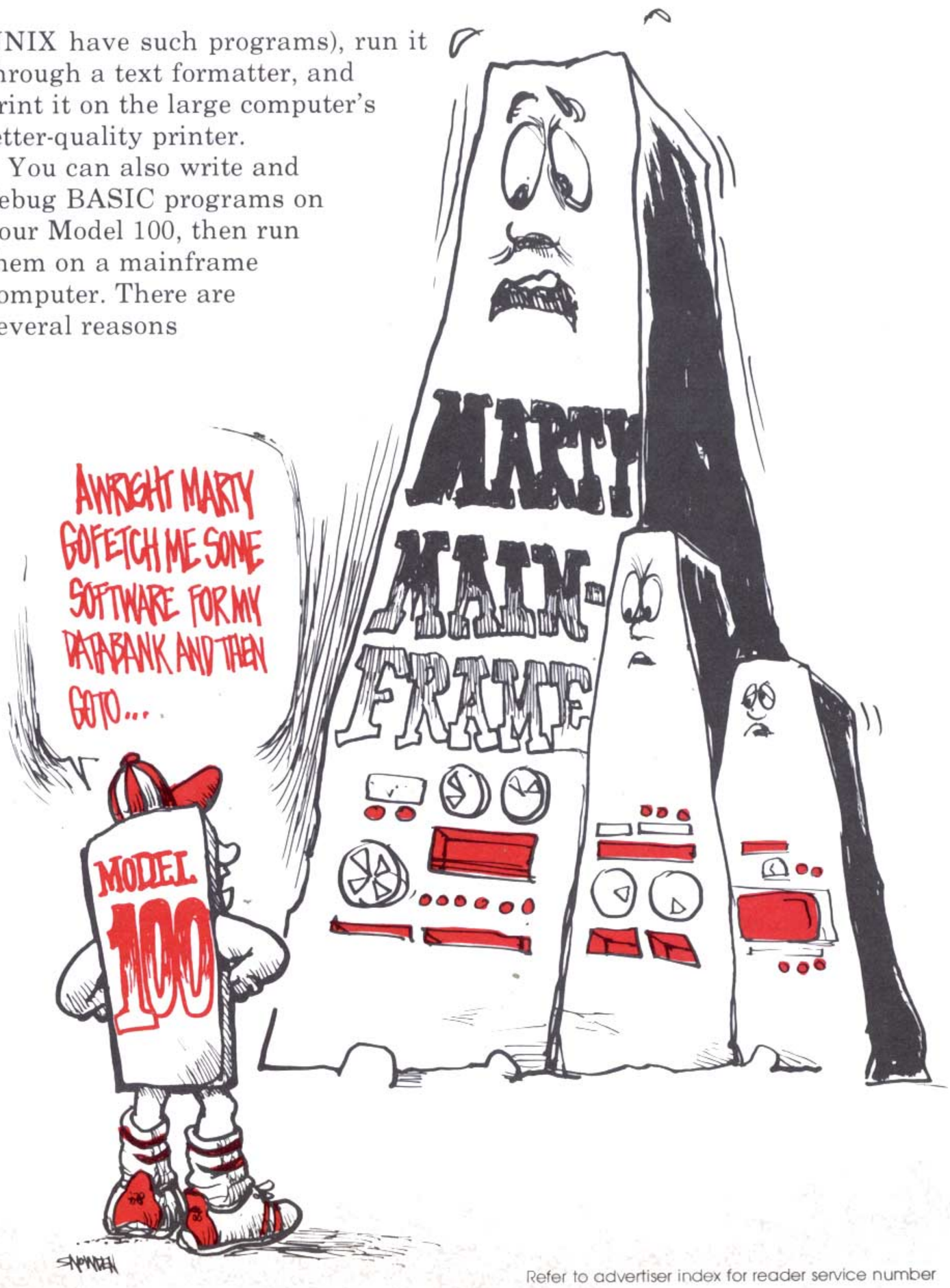
Model 100

Ben Firschein, Menlo Park, CA

You can use the TRS-80 Model 100 in conjunction with your company's or school's large computer. The Model 100 comes equipped with a telecommunications program that will let you send or receive data over the phone using the machine's built-in modem. This built-in upload/download feature is described in the manual, but only in the context of sending or receiving information from an information service, a terminal in someone's office, or another TRS-80 Model 100 computer. With a little "trickery," you can use it to store on a large computer files that have been created in the Model 100, or retrieve files from a large computer and store them on the Model 100. These files can be text, programs that you have written in BASIC and run on the Model 100, and even programs in languages such as Pascal or Lisp. You can even use the Model 100 to transfer files from one large computer to another if a real-time exchange is not needed. This completely obviates the need for a special program to allow two mainframes to communicate with each other.

Using the techniques described in this article, you can write a report on your Model 100 at home or on an airplane, transfer it to your large computer, run the report through a spelling checking program (operating systems such as VMS and UNIX have such programs), run it through a text formatter, and print it on the large computer's letter-quality printer.

You can also write and debug BASIC programs on your Model 100, then run them on a mainframe computer. There are several reasons



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why it is desirable to write a BASIC program on the Model 100 and then run it on a large computer. You could use the Model 100 to avoid timeshare costs during program development, or to write programs in an airplane or the convenience of your home. Once your program is debugged, you could run it on a mainframe which would have more speed and memory. You could also make the program accessible to many people at a time by transferring the program to a mainframe.

This article assumes that you know how to use the editor on the Model 100 and that you know how to use the Model 100's Telcom program. If you do not know the above, the manual that comes with the Model 100 is excellent. Read Part I (getting started), and in Part II, read Section 7 (main menu overview), Section 8 (text preparation), and Section 11 (computer-to-computer communications). The information I will present is either vaguely hinted at in the manual, or not discussed at all.

The sections in this article on saving and retrieving text presume no knowledge of programming. The sections on transferring programs onto a large computer, or from a large computer to the Model 100, are geared to people who know a programming language such as BASIC, Pascal or Lisp. If you plan to use BASIC, you should be familiar with Model 100 BASIC (Part III in the manual).

I used the Model 100 in conjunction with a VAX-11 computer with the VMS operating system. I will describe what to do in terms of the VAX. The keywords should be similar on your system.

Sending Text and Programs

1. Use Telcom to log in to your host computer.

2. Type EDIT *filename*, where *filename* is the name of the file in which you want to store information. Use the appropriate command on your system. Make sure you are using a line editor and not a screen editor. The information that line editors look for resembles the characters you will be sending it.

3. Type I for insert (or the appropriate command on your system). This fools the host computer into thinking that someone is entering text.

4. Now, hit function key 3 on the Model 100. This instructs the Model 100 to send a file to the host computer. The Model 100 will ask you the name of the file to upload. Type the name of a file you have stored on the Model 100. Note: If you ask it to upload a BASIC program you have written when you were in the BASIC interpreter, Telcom will give you the error message, "upload aborted." Later in the article, I will tell you how to rectify this problem. Text files that were created on the Model 100's text editor will upload without any problem, however.

> You can write a report on your Model 100 at home or on an airplane, transfer it to your large computer, run the report through a spelling checking program, run it through a text formatter, and print it on the large computer's letter-quality printer.

5. After you have typed in the name of the file to upload, the machine will respond with the prompt: "width?" Type in 80 and hit return. Since most computers assume an 80-character line, this is the safest response. It will make letters and reports the proper width and keep the computer from breaking apart BASIC program lines that are over 40 characters long.

6. You will now see your file appearing on the screen of the Model 100. When the machine stops spewing out information, type EXIT (or whatever command you use on your system to save text and get out of your editor).

7. If all has gone well, you now have a copy of your file sitting in your host computer. This file can be printed, edited, etc.

8. Log out and disconnect when you have finished talking to your host computer.

Uploading BASIC Files

We must return to that error we got when we attempted to upload a BASIC program to the host computer. Non-programmers should skip to the section on transferring files from your mainframe to the Model 100.

The problem was due to the fact that BASIC programs are stored in a tokenized format. For example, instead of the four-character word GOTO, the TRS-80 has stored a shorthand for the command. This lets it pack a large program into a small amount of memory. We must de-tokenize the program before we carry out the upload procedure I enumerated above.

To de-tokenize your program, carry out the following steps:

1. Get into BASIC.

2. Load your program from RAM or cassette.

3. Type SAVE "RAM:FILE NAME.DO",A (with no spaces). Where filename is a filename different from that of your program. This saves an ASCII (non-tokenized) version of your program in the memory of your computer.

4. Upload the de-tokenized file using the upload procedure I described above to get a copy of the program on the mainframe computer. You can print out the program now, edit it, or send it to another user on the large computer. (Some systems such as VMS and UNIX have a mail utility.)

Once you have a de-tokenized BASIC program, you can also run it on the mainframe:

1. Get into Telcom and log in to your host computer.

2. Type BASIC (or whatever the command is on your host computer to get into the BASIC interpreter).

3. When a BASIC prompt appears, hit the upload key (F3).

4. Type the name of the ASCII file you made by the above procedure.

5. You want an 80-column line.

6. The program will appear on the screen of the Model 100, and the host computer will be fooled into thinking that someone is keying in lines.

7. When you get back a BASIC prompt, type RUN.

8. Your program should run on the host computer.

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Keep in mind that there are different versions of BASIC. Some commands such as GOTO, FOR, IF, and PRINT can be found in most versions of BASIC; other commands such as string operations, file access commands, PEEK, POKE and graphics will vary or be nonexistent on some machines. In the event of a non-compatible command, consult your host computer's BASIC manual.

Also beware of the fact that some characters on the Model 100, such as the graphics characters, do not exist on most other computers. These will probably be converted into other characters, or ignored. For example, the Model 100's graphics character for a filled-in square, became a lowercase "o" on the VAX-11.

Other Programming Languages

Although the Model 100 can only run BASIC programs, you can use its editor to write programs in languages such as Pascal and Lisp. I was able to write several Pascal programs using the Model 100's text editor, transfer them to the VAX-11 computer by uploading them into the VAX editor, and then compile, link and run them. This should work with other compiled languages.

I was also able to write programs in Franz Lisp, an interpretive artificial intelligence language, by using the Model 100's text editor and then transferring them to the VAX-11. I will briefly describe transferring Lisp programs from the Model 100 in case there are any Lisp users out there. Non-Lisp users should skip to the section on transferring files from the mainframe to your Model 100.

1. Write your Lisp function definitions and function calls using the Model 100's text editor.
2. Use Telcom to log in to the mainframe.
3. Get into Lisp.
4. If you want to add your new functions to a previous workspace, load the old workspace in with the (load 'filename) command.
5. Upload your file from the Model 100 with a 40-column line width.
6. As the file is uploading, the Lisp interpreter will be fooled into thinking that someone is defining functions, calling functions, etc.
7. When the Model 100 has finished uploading, you can save the new Lisp program using the Lisp (wsave 'filename) command.

From Mainframe to Model 100

1. Use Telcom to log in to your computer.
2. Enter TYPE *Filename* (or whatever the command is on your system to list files). Do *not* hit enter.
3. Hit the download key (F2).
4. Type the name of the file in which you want to store the information, and press enter.
5. Press enter again. This causes the host computer to see the TYPE *Filename* command you gave it in step 2.
6. The Model 100 should now start downloading the file.
7. Assuming that the procedure worked on your computer, hit the download button (F2) again to stop downloading.
8. Log off your host computer and return to the Model 100's main menu.
9. Use the Model 100's editor to access your file. Look at the beginning of the file for unwanted characters. You will sometimes get a prompt character from the big computer at the end of the file. If so, delete it. You now have a copy of the file that was stored in the big computer.
10. If the file was a BASIC program from the host computer, you should be able to get it to run on the Model 100 if the two BASICs are compatible. To do this, get into BASIC and load the file from RAM into BASIC using the F2 button. The file will automatically be tokenized. Now, RUN the program. Assuming compatibility, your program should run on the Model 100.

Transferring Files Between Mainframes

You can now transfer files from a mainframe to the Model 100 and from the Model 100 to a mainframe. You, therefore, have the capability to transfer a file between two mainframes, assuming that you do not need a real-time transfer, and that both mainframes allow telephone access. Simply download the file from mainframe 1 to the Model 100 and upload the file from the Model 100 to mainframe 2 using the procedures I have given you.

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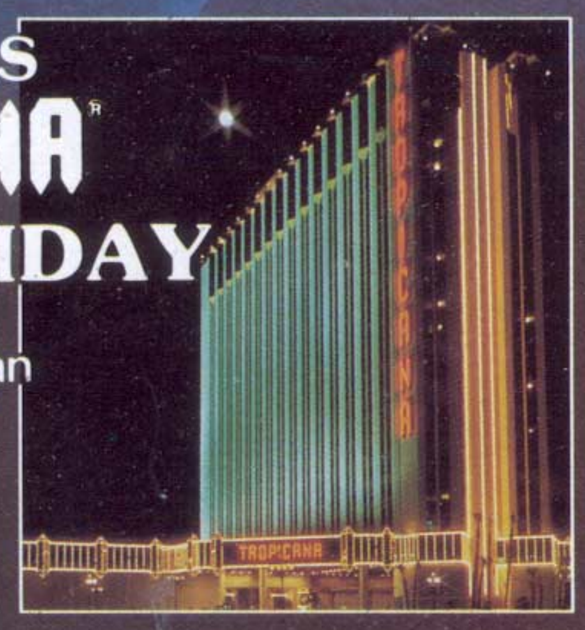

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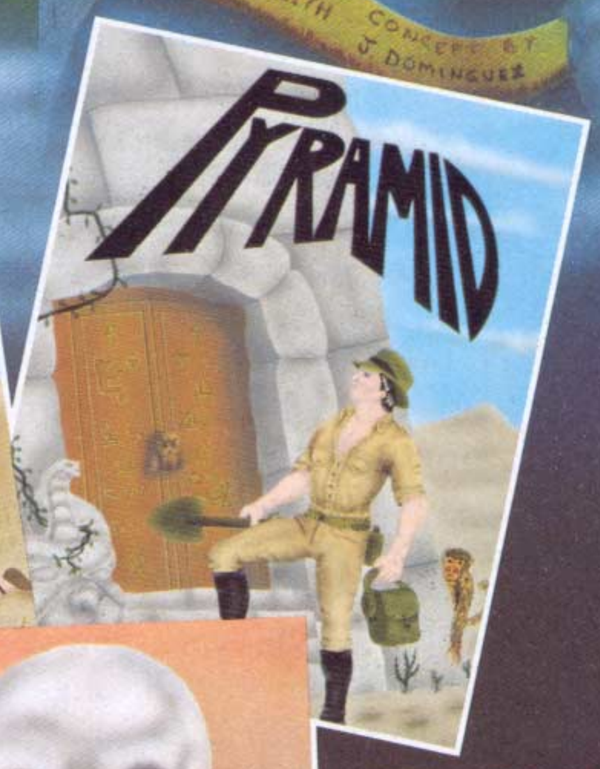

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Probing Profile

Accessing Profile III+ files from BASIC

Models III/4

Timothy K. Bowman, Spokane, WA

I read with great interest Terry Dettmann's article on accessing Profile files from BASIC in the April, 1983 issue of *Basic Computing*. As a very active user of Profile III+, and in need of modifying several Profile III+ data fields, I thought that this was the article for me. After keying in the listing, I found, however, that it wouldn't work correctly. Knowing a lot about how to operate Profile III+ as a stand-alone program, I set out to modify Terry's program to work on Model III Profile III+.

Profile III+ File Structure

Before I highlight the changes I made in Terry's program, let me briefly describe how Profile III+ stores records in the respective files. Data is stored in variable-length random access files in ASCII format. This variable length is set when you define your files while using the Creation menu in Profile III+. If you are unsure about what variable length random access files are, and how to use them, please review your Model III disk operating manual. (Pay particular attention to pages 134 to 138 and 150 to 154.)

Up to five principal files are used to store Profile III+ information. The first, basename/MAP, defines what the file structure is and where to find it. Basename/KEY holds the fields for segment 1 information, basename/DAT holds the fields for segment 2, basename/DA2 holds the fields for segment 3, and basename/DA3 holds the fields for segment 4. You should note that the basename is an eight-character alphanumeric database name that you assign. If you assign a name shorter than eight characters, Profile III+ "pads" the file with zeroes.

Every database created will have at least two files: the /MAP and the /KEY files. The /KEY file is also the only file that can be used for sorting purposes by Profile III+. Depending upon how many additional segments are opened up, the DAT, DA2, and DA3 files are opened and used.

Looking at the File

If you want to look at how a Profile III+ file is stored on the disk, try listing one of your Profile III+ /MAP files using the TRSDOS command LIST basename/MAP (SLOW), or if you want a hard copy, LIST basename/MAP (PRT). Your listing should be in the same format as the short excerpt given in Figure 1. You can interpret the results using the description given in Terry's article and compare the field descriptions and sizes to a listing of your files. Such a listing can be generated from the "Define Files" menu in Profile III+.

The key difference between Profile III+ files and Profile Plus, or Profile II, is that Profile III+ stores the information in up to 255-byte variable-length records, while Profile for the Model II stores three logical records of 85 characters which total 255 bytes physical length.

April, 1983 Program Changes

Armed with the above information, I set about to modify the program. If you have keyed in the April, 1983 program exactly as originally presented, I will highlight the changes I made. Please compare the linenumbers I note in the following paragraph with the earlier listing and make the necessary changes. If you haven't keyed it in yet, key in Listing 1, which incorporates all of the changes.

I discovered many of the changes through much trial and error. In lines 100 and 110, the DIM statements have to be changed to reflect the possibility of 256-character length records and add a new variable. Line 120 has a simple substitution of 59 and 58 for 78 and 77 to reflect the smaller screen size on the Model III. Line 210 has added "III+" to the heading for cosmetics. Line 270 begins the significant changes. Because Profile III+ doesn't store records in three, 85-byte logical records, the loop had to be eliminated, yet the value of J=1 was retained as it is used as a flag value for use in subroutines. In addition, the value of AR was changed to eliminate the 3 value.

Line 280 was modified to recognize the end of the records and print a message in the center of the screen. Deletion of line 290 eliminates the loop. The value of FX in line 1330 was changed to reflect variable-length records. Similar changes were made in lines 1450, 1460, 1570, and 1620.

The FIELD statement in 1430 was modified to reflect the manner in which Profile III+ stores records for the DAT, DA2, and DA3 segments. Line 1470 was additionally changed to change the setting on flag KM and establish a new flag KN (which stores the beginning record number of information on segment 2 data and beyond).

Lines 1532 and 1535 were added to retrieve segment 2 through 4 information from their respective files and to take care of some housekeeping. The GET statement in

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line 1560 was changed to reflect the value of AR.

Finally, the tab setting in lines 1350 and 1630 were changed to fit the screen requirements of the Model III. Whew! I didn't know I could say all that in one breath!

Oh, yes. In case you are wondering about lines two and four, they are a technique I use to keep track of when I last updated a program. For further information, see the October, 1982 issue of *Basic Computing* for an article entitled "Automatic Program Dating."

Operating Hints

In using the program, be sure to use it with a Profile III+ diskette that has been backed up. You don't want to lose any files. If you terminate the program by pressing the BREAK key, be *sure* to type CLOSE and press enter to close the files and buffers. Also, open BASIC with four variable-length files using the command 4V at the number of files prompt.

This program simply displays sequentially the field names and the associated data. It could easily be modified to reformat data. In fact, the reason I originally needed the program was that I wanted to present dollar information using dollar signs and commas which Profile III+ would not allow me to do. However, using our trusty PRINTUSING statement, the task was easy. My Model III program read the Profile III+ files with BASIC and formatted the output. The other possibilities are only limited by our imagination and include sorting on fields other than those in segment one, modifying data, re-indexing the file, increasing the number of heading lines in reports, and on, and on.

The real beauty of this modification is that it is a "generic" solution to reading Profile III+ files. Most of the programs I have seen previously depend heavily upon the user knowing the file layout of the specific /KEY file. Why not have BASIC read the /KEY file and do the "dirty work" for us?

My thanks to John Nalls of Thousand Oaks, California, who helped with this solution by pointing out some of the finer points of how Profile III+ stores records and how to meet those challenges.

Another Approach

For another approach to reading Profile III+ files from BASIC, I recommend the Profile III+ series that has been running in Tandy's *TRS-80 Microcomputer News*. The article on page 5 in the July, 1983 issue, is especially helpful. It shows how to custom design a program to read a specific file.

Concluding Comments

I share Terry's conclusion that Profile and Profile III+ are some of the best pieces of software that Radio Shack offers. I have found it sufficiently flexible to meet most of my database needs and especially appreciate its menu approach to file and report creation, ease of use, and the ability to transport data to SuperScripsit and VisiCalc.

If you have had success in reading Profile III+ files using BASIC that you would like to share, or have a question concerning any phase of Profile III+, please write to me in care of *Basic Computing*. If you would like a personal reply, I would appreciate a self-addressed, stamped business-size envelope.

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Profile II and Profile users who desire reprints of the April, 1983 article, or those who wish to have their requests forwarded to Mr. Bowman, should write to Basic Computing, 3838 So. Warner St., Tacoma, WA 98409.

Figure 1

```
File = ARTICLE0/MAP      LRL = 256        REC =      1
1...5....10...15...20...25...30...35...40...45...50...55...60

File = ARTICLE0/MAP      LRL = 256        REC =      1
.F.              .Title#.Magazine Name..Date of Issue..
E402222222222220567662046667666246660046762662477760022222
E6000000000000005494C53DD171A9E50E1D55D41450F609335550000000
-------------------------------------------------------------

2222222222222222222222222222222222222222222222222222222222
0000000000000000000000000000000000000000000000000000000000
-------------------------------------------------------------

2222222222222222222222222222222222222222222222222222222222
0000000000000000000000000000000000000000000000000000000000
-------------------------------------------------------------
                                                .#(
2222222222222222222222222222222222222222202222222222222222
0000000000000000000000000000000000000000380000000000000000
-------------------------------------------------------------

2222222222222222
0000000000000000
-------------------------------------------------------------
File = ARTICLE0/MAP      LRL = 256        REC =      2
...              .Page..Description..e..Date of Issue..
EB022222222222220566600467676776669060046762662477760022222
E200000000000000401753B453329049FE6055D41450F609335550000000
-------------------------------------------------------------

2222222222222222222222222222222222222222222222222222222222
0000000000000000000000000000000000000000000000000000000000
-------------------------------------------------------------

2222222222222222222222222222222222222222222222222222222222
0000000000000000000000000000000000000000000000000000000000
-------------------------------------------------------------
                                                ..(
2222222222222222222222222222222222222222002222222222222222
0000000000000000000000000000000000000000380000000000000000
-------------------------------------------------------------

2222222222222222
0000000000000000
-------------------------------------------------------------
```

Program Listing — Accessing Profile III+ Files

```
2 T$=                    "Last Update =
 Ø9/28/83 Ø4:2Ø:34"
4 A$=TIME$:L=PEEK(VARPTR(T$)+1)+256*PEEK
(VARPTR(T$)+2):FORZ=1TO17:Q=ASC(MID$(A$,
Z,1)):POKEL+(Z+13),Q:NEXTZ
1Ø REM : : : : : : : : : : : : : : : : :
 : : : : : : : :
2Ø REM
25 REM      READ PROFILE III+ FILES FROM
 BASIC
3Ø REM      BY TIMOTHY K. BOWMAN
35 REM      FOR BASIC COMPUTING
4Ø REM      MODIFICATION OF A PROGRAM BY
 T.R. DETTMANN
45 REM      ORIGINALLY PUBLISHED IN APRI
L, 1983, PAGE 83
5Ø REM
```

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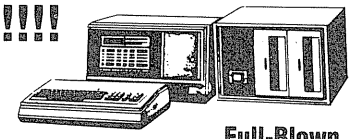

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```
55 REM       VERSION 99.Ø
6Ø REM
65 REM     Be sure to open 4 variable fi
les when entering BASIC
7Ø REM
75 REM : : : : : : : : : : : : : : : : :
 : : : : : : : : : : :
8Ø REM
1ØØ CLEAR 1ØØØØ:DIMFE$(4),DA$(256),DB$(3
),DC$(256)
11Ø DIMHD$(256),LN%(256),FL(256),FF(4)
12Ø DEF FNHDR$(X$)=STRING$(((59-LEN(X$))
/2),">")+" "+X$+" "+STRING$(((58-LEN(X$)
)/2),"<")
13Ø FE$(1)="/KEY":FE$(2)="/DAT":FE$(3)="
/DA2":FE$(4)="/DA3"
2ØØ REM ****   MAIN PROGRAM  ******
21Ø CLS: PRINT FNHDR$("PROFILE III+ FILE
 READER"):PRINT:PRINT
22Ø LINEINPUT"FILENAME:  ";FF$
23Ø FF$=LEFT$(FF$+"ØØØØØØØØ",8)
24Ø GOSUB1ØØØ :IFN=ØTHENPRINT"ERROR - FI
LE DOESN'T EXIST";:PRINT:PRINT:GOTO22Ø
25Ø GOSUB13ØØ
26Ø FORI=1 TO LOF(1)
27Ø J=1:AR=(I-1)+J
28Ø GOSUB15ØØ :IF EF=ØTHEN GOSUB16ØØ ELS
E I=LOF(1):GOTO31Ø
3ØØ NEXTI
3Ø5 CLS:PRINT @53Ø,"That's all of the ac
tive records!"
31Ø CLOSE
999 END
1ØØØ REM  -------   GET HEADING INFORMAT
ION
1Ø1Ø N=Ø
1Ø2Ø OPEN"R",1,FF$+"/MAP"
1Ø3Ø FIELD1,1 AS D1$,2 AS RL$,13 AS D2$,
239 AS HE$
1Ø4Ø IF LOF(1)<=Ø THEN GOSUB 115Ø : RETU
RN
1Ø5Ø FOR I=1 TO LOF(1):GET1,I
1Ø6Ø   FF(I)=CVI(RL$)
1Ø7Ø    IN$=HE$
1Ø8Ø    GOSUB 12ØØ :IF LN<>Ø THEN 1Ø8Ø
1Ø9Ø    NEXT I
11ØØ CLOSE:RETURN
115Ø REM  - - - - OOPS FILE DOESN'T EXIS
T - - - -
116Ø CLOSE:KILL FF$+"/MAP"
117Ø RETURN
12ØØ REM   - - - -    DECODE HEADING ENT
RIES - - - -
121Ø LN=ASC(MID$(IN$,1,1)):IF LN= Ø THEN
 RETURN
122Ø N=N+1:HD$(N)=MID$(IN$,2,LN)
123Ø LN%(N)=ASC(MID$(IN$,LN+2,1))
124Ø FL(N)=I
125Ø IN$=MID$(IN$,LN+3)
126Ø RETURN
13ØØ REM  - - - - OPEN DATA FILES FOR US
E  - - - -
131Ø K=Ø:FOR J= 1 TO 4:IF FF(J)=Ø THEN R
ETURN
132Ø    F$=FF$+FE$(J)
133Ø FX=FF(J)
134Ø    OPEN"R",J,F$,FX:KN%=Ø
135Ø    PRINTTAB(17) "OPENING FILE";J;"
 ";F$
136Ø    GOSUB 14ØØ:IF EF=Ø THEN 136Ø
137Ø NEXT J
138Ø RETURN
14ØØ REM - - - -   FIELD CURRENT FILE -
- - -
141Ø EF=Ø: ON J GOTO 145Ø, 142Ø, 142Ø,14
2Ø
142Ø IF FL(K+1)<>J THEN EF=1: RETURN
143Ø K=K+1:FIELD J,FF(J) AS DC$(J)
144Ø KN%=KN%+LN%(K):RETURN
145Ø EF=1:FIELDJ,FF(J) AS DB$(J)
146Ø FOR K=1 TO FF(J):IF FL(K)=1 THEN NE
XT K
147Ø K=K-1:KM=K+1:KN=KM:RETURN
15ØØ REM  - - - -  GET RECORD NUMBER - -
 - - -
151Ø EF=Ø:FORK=1 TO 4: IF K=1 THEN GOSUB
 155Ø:IF EF=1 THEN RETURN ELSE 154Ø
152Ø    IF FF(K)=Ø THEN RETURN
153Ø    GETK,AR
1532 LL=1:FOR L=KM TO LN%(K):DA$(KM)=MID
$(DC$(K),LL,LN%(KM)):LL=LL+LN%(L):KM=KM+
1:NEXTL
1535 KM=KN: REM reset counter for segmen
t 2 files
154Ø NEXT K: RETURN
155Ø REM  - - - - -  GET KEY RECORD - -
- - - -
156Ø GET1,AR:LL=1:IF MID$(DB$(J),1,1)=CH
R$(Ø) :RETURN
157Ø FOR L=1 TO FF(J):DA$(L)=MID$(DB$(J)
,LL,LN%(L)):LL=LL+LN%(L):NEXT L
158Ø RETURN
16ØØ REM  - - - - - -   DO ANYTHING WITH
 THE RECORD - - - - -
161Ø CLS: PRINT FNHDR$("RECORD NUMBER:"+
STR$(AR)):PRINT:PRINT
162Ø FOR K=1TO FF(J): IF LN%(K)=Ø THEN 1
65Ø
163Ø PRINT HD$(K);TAB(2Ø)DA$(K)
164Ø NEXT K
165Ø PRINT: PRINT
166Ø LINEINPUT "PRESS >ENTER< TO CONTINU
E";X$
167Ø RETURN
```


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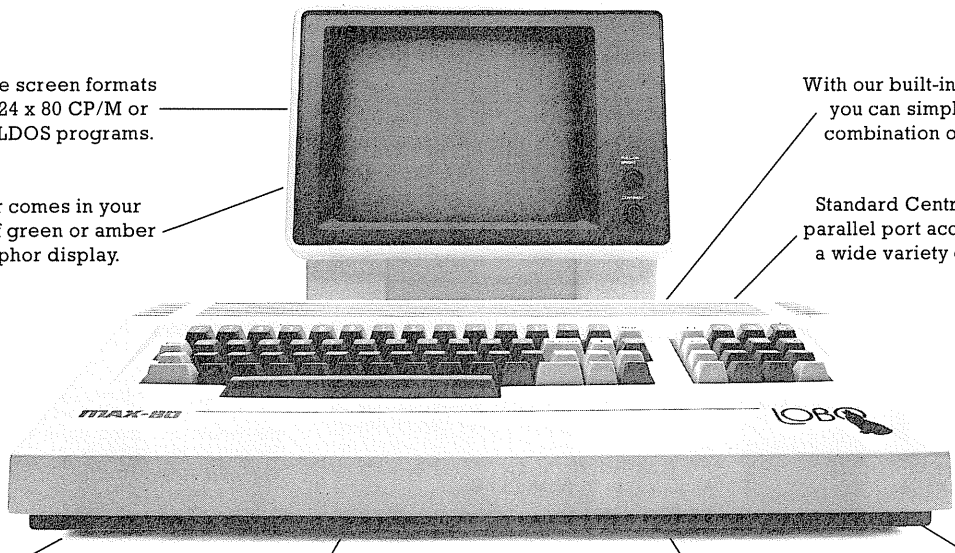
THE COMPUTER TANDY SHOULD HAVE BUILT.



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Our 5MHz Z-80B processor runs your programs 25% faster than TRS-80 Model 4.

Rugged construction includes heavy duty case and full-stroke sculptured keyboard.

Available storage includes Lobo's 5-1/4" floppy, 8" floppy and Winchester hard disks.

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AT THE PRICE TANDY SHOULD HAVE CHARGED.

The bottom line is this. For far less than the price of a TRS-80® Mod 4, you can own a lot more computer.

A computer that's 25% faster.

That supports both the CP/M® Plus and LDOS™ operating systems.

A computer that features a price tag of only $945 for the MAX-80® processor. And that expands with your needs without breaking your budget.

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When you put it all together —an entire system, including a dual 5-1/4" floppy drive subsystem (320 Kb of disk storage), monitor, CP/M and LDOS —totals up to just $1599.

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And since our MAX-80 features two RS-232C serial ports, you can easily add both printer and modem without switching back and forth.

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What's more, Lobo offers almost any peripheral you might want to add to your MAX-80. At very special prices.

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For your TRS-80 Models I, III, & IV and CoCo.

THE ELIMINATOR
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For your TRS-80 CoCo.

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For your TRS-80 Models I, III, & IV.

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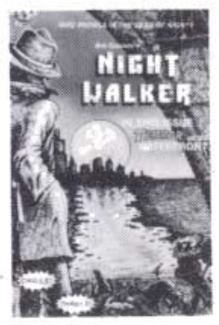

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Finally! A battle game that lets players on different computer systems pit their skills against one another. All you need is a friend with an APPLE, ATARI, or TRS-80 and a full-duplex modem (or a modem eliminator cable if the computers are in the same room). Your mission: Find and destroy the enemy's base before he discovers and annhilates yours.
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It's 1913. You're Inspector Black of Scotland Yard, and until today you thought you'd seen it all. However, nothing you have ever experienced prepared you to solve the horrifying mystery of THE CURSE OF CROWLEY MANOR.
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Buildings crumble to dust, and the earth opens to swallow what remains. You stumble through the ruins of what, just last night, was beautiful San Francisco. Time is running out — which way do you go?
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Vietnam, May 1975. Crashing through the jungle foliage, you hear the distant fire of the NVA camp guards. You've escaped — for now. Uncle Sam is pulling out, and if you don't reach Saigon soon, you'll be left behind
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The keystroke ballot box

Computerized balloting in Colorado

For all readers

Thomas Foulks, Colorado Springs, CO

November, 1992

The John Jones residence, Anywhere, USA

John: "Mary, did you vote yet? I need to use the computer!"

Mary: "Oh, wait a minute, dear . . . I voted, but I don't think Johnnie did."

John: "Well, he can vote with his own computer."

Futurists have long envisioned computerized balloting on the horizon. I wanted to know what the public response would be if today's voters were offered a computerized ballot, with voting a matter of a phone call and a few keystrokes from their home computer.

Would computer voters take it seriously? Or cast ballots frivolously? Would the campaigners try to "stuff" the electronic ballot box? Would newer computer users get confused and cast mistaken ballots? Would there be any correlation between computerized voting results and results of a real election? Would people believe such a computer use is possible?

With a Colorado Springs municipal election approaching, I set about getting some answers to the above and similar questions. The answer to the question of correlation was amazing — the computerized voters were 100 percent correct in matching the official election results in all six ballot items!

On a Friday morning preceding a Tuesday election, my microcomputer bulletin board service (BBS) began offering a "mock election" as the lead item of the menu at user log-on. The morning edition of one of the city's two daily newspapers carried a story on the mock election, based on a news release I had distributed earlier. I left messages on other BBS's in the area that my system was being used for such a test. That was the only organized pre-publicity.

To vote in the test, you needed only a computer with terminal software and a modem — items that could be readily bought in Colorado Springs for about $200 on the day the mock election began (and have since become even less expensive). You also need a telephone, through which the modem (MOdulator-DEModulator) would convert computer signals into telephone line signals that could be understood by my computer at the other end of the telephone call. My estimate was that somewhere between 1,000 and 3,000 such equipment packages were available in the city.

My BBS nominally operates from 2 p.m. to 5 a.m. daily, because it shares its telephone line with business calls to the word processing business my wife and I operate. It was suited to such a test because the operating system is TBBS (The Bread Board System, Ebert Personal Computers, 4122 So. Parker Rd., Aurora, CO 80014) which contains a program for creating election-type ballots. Because the system is single-line, single-user, I had to spread the test over several days to allow sufficient user access.

The test had no sanction or support from the city government; none was sought. I wanted to assure full independence of the test and, similarly, wanted to be sure that no one could conceivably confuse my test with the official election.

Setting up a Computer Ballot

Using a printed official sample ballot from the City Clerk's office, I built a computer ballot. There were three candidates for mayor; my ballot allowed only one vote, for one of the three. There were eight candidates for four at-large city council seats; my ballot showed the candidate slate four times with instructions to vote for a different one at each display. The bond election was a for or against vote; my ballot would accept only one vote either for or against.

Refer to advertiser index for reader service number

In other words, the ballot on my telecommunications system was as close to the real thing as it could be. There were no write-in candidates (who must officially declare as candidates in Colorado), so no provision had to be made for them. Colorado Springs voters use punch card balloting, so I had no need to provide for data input of more than one character.

The typical real voter would cast a ballot by punching six holes in a card. My computerized test required six keystrokes to make selections in the same contest. To exit the ballot file, the computerized voter had to make one more keystroke (an automatically-incrementing counter) so the system could count how many users voted.

Because the TBBS system does not link user information with votes, the ballot was, indeed, secret. (TBBS writes to file as each vote is cast, providing an actual runtime count of votes; but no reference as to who cast the votes.)

I stress that point -- the voting was secret. My runtime file of BBS use would show only that a user had accessed the ballot, and had not aborted from that file. What happened while the "voter" was using that file was known only to the computer, while the user was actually on-line. (Admittedly, someone watching the terminal 24 hours a day could have kept track of the balloting. There are other problems with such a system, as well, which I'll take up later in this article.)

The Test Began

Activity was slow on the first day. Only 12 ballots were cast, as seven other users chose not to access the voting file.

However, the test was drawing media attention. Television cameramen came to visit, shooting footage for features on weekend newscasts. Friday evening brought a call from the other newspaper: Would I pose for a picture beside my computer Saturday morning? Of course.

Sunday night: News spots on two stations. Monday morning: A one-third-page feature in the newspaper, picturing me and my TRS-80 Model I.

By 8 a.m. Monday morning (from Friday through the weekend), 54 ballots had been cast in the mock election. A couple of dozen users (or more) had bypassed the voting item (it seems some always choose to not vote, no matter how easy).

Monday afternoon and evening brought a typical last-minute voting rush. By 7 p.m. Monday, when the experiment ended, 18 additional voters had cast their ballots. (I know that doesn't sound like many, but my BBS allows 30 minutes on-line time to regular users, and many of them were using their full time for system use other than voting.)

During about three hours of later afternoon-early evening, the BBS was not off-line for more than 30 seconds at a time. Ah, the wonders of publicity! What's more, many of the callers were first-time users of the system, requiring them to go through a standard log-on procedure of about three minutes.

At 7:06 p.m., I shut down the system (after waiting for the latest

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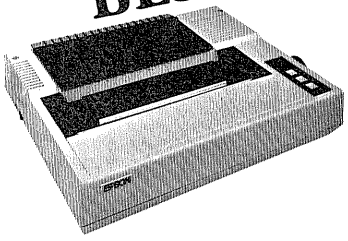

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user to terminate gracefully) and began tabulating.

At 7:10 p.m., I was through tabulating, and had a printout of the total results from an 84-hour election laying on my desk — thanks to another TBBS system program, which automatically tabulates and prints the results of a voting file.

Who had voted? Well, just as a poll watcher in the standard polling place process, I could look at the file of those who cast ballots. I knew that many of my regular system users had voted and because I knew some personal information about them (just like a political precinct leader), I could speculate about the circumstances under which they voted. Hence, I could surmise that two of the voters had voted with terminals from the electronics assembly factory where they work. I could also guess that a director of a local government agency had voted from the terminal beside his desk. I also knew that several teenage users of the system avoided the ballot, just as if they knew they were not eligible to vote. But for dozens of other voters, I knew only the name by which they logged-on.

I also knew who hadn't voted. That also was somewhat of a surprise, given the favorable publicity. None of the candidates voted and no news department personnel from either the newspapers or television stations accessed the system, despite their favorable stories. So, there was no discernible effort at ballot-box stuffing, nor did the news media attempt an independent check of the mock election. A certain lack of awareness within politicians and media alike surely seems indicated.

One of the television stations had asked to have the results phoned in. They were reported on the 10 p.m. news, with a quip from the anchorman that it was "not a very scientific poll" because it was conducted "only among computer owners." There is a contradiction of terms, of sorts, there. The newspapers had also wanted the results, which one chose not to print; and the other garbled the numbers.

The Real Election

Like any other good citizen, I voted the usual way Tuesday, with no analysis possible of my "mock election" results, until the official election was completed. I point out that I voted, because the circumstances are pertinent. It was springtime in the Rockies in Colorado Springs on April 5 — gusty winds, snowflakes in the air, chill factor of 10 degrees, but, at least, not a long line at the polling place. Also, city officials had moved our polling place to a school different from its location at the last general election, which meant my wife and I were both gone from our offices for more than 45 minutes, first to one school, then to the right one.

Came Wednesday morning, and I could see what correlation there was between the two elections, mock and real.

In my mock election, 71 voters had cast 72 ballots. (Yes, one of them voted twice and I know who.) In

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the official election, 17765 voters (of about 75,020 possible) cast ballots. Correlation of the outcome? As noted above, 100 percent — each winner in each race came in the same. The correlation between percentage of vote varied no more than 12 points between the final position of the various candidates; surprisingly close.

The only deviation came in ranking of the four losers in the eight-way city council election. One of the losers obviously had more popularity among computer voters than among city voters.

Amazing? Yes! A fluke? Oh, certainly, yes — and any statistician or demographer could instantly demolish any claim from me that it is other than a fluke. But, ah, such an interesting fluke!

Equally interesting was something else which happened on the day of the official election. People were calling our regular business lines, asking when the computer would be on-line again, so they could vote. When the service resumed at its normal 2 p.m. time, I watched from the terminal as several users searched through the system, obviously trying to find the voting file which was no longer there. Public acceptance? Well, certainly public interest.

That was the test; to my knowledge, one of the first such tests in the nation, and probably the first such test for a city the size of Colorado Springs. I make no claim that it was a scientific sampling, nor do I claim the results are of any more significance than this commentary. There will be, however, more such tests in the future, here and elsewhere, of that I am certain. The great potential of computerized balloting will be tested, refined and re-tested in the years ahead and maybe someday become the "real" thing.

The Big Issues

Let's be a little more serious about the issue of computerized balloting. I submit as my credentials for such seriousness, my background as a former chief administrator of El Paso County, of which Colorado Springs is the county seat; and also as twice chairman of the Board of County Commissioners, the body responsible for (among other things) election conduct and supervision, precinct mapping, data processing management, registration rolls certification, etc.

The first and foremost need of a computerized voting system is, of course, computer access. No one knows when the predictions will come true that most American households will have some form of computer terminal. Until then, almost any interpretation of the Federal Voting Rights Act (which outlawed literacy tests, poll taxes, etc.) could block computerized voting as a "denial of access" to those without equal computer access. Setting up computer terminals at the corner convenience store would not really cure that problem. Only time will tell when this need is met.

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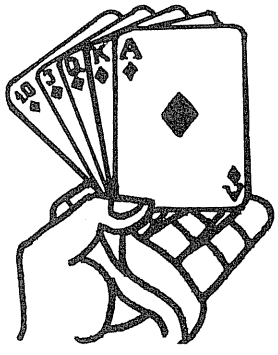

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need is one which my small system could not handle — the need for multi-line, multi-user simultaneous access. Such systems are already in use by the national database services (The Source, CompuServe, and others). But such installations would be very expensive for counties or municipalities; and such expense could possibly rule out computerized balloting for many smaller political subdivisions. There is no absolute rule nationwide over how ballots are to be cast — from the technological standpoint, a rich, ultra-progressive county or city could experiment with such a system today.

There is also a question of public acceptance and public ability to function with the computer. Anyone familiar with computers is also familiar with tales of "keyboard freeze" or downright distrust of computers by persons who, for whatever reason, simply cannot or will not cope with a computer. For them, some alternate means of voting would be necessary. (Maybe an oath, "I swear I cannot cope with a computer, so help me God!")

Another question to be answered by politicians and society alike: Should the realtime vote-counting capability of computerized voting be used? If there were hourly reports of how the various campaigners were progressing, might it interest more persons in voting? Build a bandwagon for the front-runner? Win support for the underdog? Or, if the early-hour reports placed "your" candidate surprisingly in the lead, would you leave your terminal off?

Still, computerized balloting could eliminate "the California problem" of the east coast and midwest predictably deciding elections before west coast polls close — there could be one uniform voting time period coast-to-coast, because normal workday logistics could be ignored.

The most serious problem of all is registration and voter identification. It would be relatively easy to devise a totally-unique access code for every registered voter. (Example: Precinct number plus registration roll number within that precinct.) But how could the numbers be kept secret? How could we prevent voter access codes from being bought and sold in a campaign marketplace? Unlike an election judge, the computer can't look you in the eye and say, "Weren't you in here just a little while ago?"

Enough about problems awaiting solutions. Let's look at some of the potential benefits of computerized balloting.

First of all, the old "bad weather" syndrome holding down voter turnout would become a thing of the past. Voting by computer terminal might not necessarily always improve turnout, but certainly would keep an election day snowstorm from harming turnout.

Once front-end costs were amortized, computerized balloting would surely be less expensive. No voting booths to carry to polling places, and no need for crews to carry them there and back again. No need for the single-purpose voting machines, of whatever kind; their replacements being multi-purpose computer terminals. No need for the coterie of officials — most of them taxpayer-paid — sitting around the polling place all day, ladies knitting and men tale-swapping.

Likewise, no need for your travel to and from a polling place. Cast your ballot from home or office, in just a few moments, and return to your regular work. No need for kind-hearted employers to allow longer lunch hours on election days so workers can cast a ballot (or have a second beer). No need for the pile, upon pile, of paper produced by present election systems. The television networks could resume

Table 1

Results of experimental electronic election (compared to the official election vote):

Candidates for Mayor of Colorado Springs

	Votes	Mock Vote % of Total	Actual % of Total
1. Robert M. Isaac	40	55	66
2. Thomas C. "Tom" Fischer	26	36	26
3. Fredric James Weber	7	9	7

Colorado Springs City Council Candidates:

1. Mary Vieth	54	75	77
2. Wilton "Buster" Cogswell, III	38	52	64
3. Bill Snyder	40	55	51
4. Frank Parisi	39	54	46
5. O.J. Lucero	21	29	31
6. Lee Duran	28	38	31
7. Bob Woodruff	29	40	29
8. John H. Montgomery, Sr.	17	24	20

Garden of the Gods Road Railroad Grade Separation Bonds

1. FOR THE BONDS	40	55	67
2. AGAINST THE BONDS	32	44	28

TOTAL BALLOTS CAST: (Mock) 72 (Actual) 17,765

In summary, the mock election correctly presaged the outcome of each race, and did so within 12 percentage points of the actual percentage of the winning vote in each race. The only "miss" was in the ranking of the second four in the city council race, with the outcome for Woodruff incorrect.

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standard programming on election nights, because results would be known within minutes of the end of the voting day.

All of those, fascinating thoughts. And the 1984 elections are still months away, while computer technological advancements come almost daily.

What's Ahead?

I'm laying plans for a far larger test of computerized balloting in the 1984 general election. The software used for the just-completed test is under review by its author, with comments from me on other functions it could perform. Some form of pre-registration system needs to be devised, and I'm certainly open to suggestions from those familiar with microcomputer telecommunications systems. The next Colorado Springs test could well involve two or more bulletin board services (the city has five, as of this writing).

Public interest and awareness seems certain to grow, as more households have computers in them. Political and media awareness, of course, will follow in tandem with consumer awareness. Some form of campaigning via telecommunications is very predictable for the 1984 elections. And, at some point, some computer manufacturer will be trying to find a city or county to serve as a test-bed for its newly-developed voting system.

Oh, certainly, those are all predictions — but does anyone doubt their eventuality?

A BBS, or bulletin board service, is the offering by a computer user to place a machine on-line for telephone access by other computer users. Because the BBS can store messages and other text material sent to it; and send such material back to other computers, BBS's are used for exchanges of messages, computer programs, data files and similar material. Generally, the operation is virtually automatic, with the BBS host computer answering the phone and sending instructions back to the remote computer user on how to use the system. Many BBS's are operated solely by individuals; others, by businesses or computer groups. Almost all cities have one or more such services, and there may be 1,000 or more nationwide. They are a phenomenon whose growth rate apparently parallels consumer purchases of home or personal computers.

Thom Foulks is a former broadcast and print news editor, who recently began researching and writing on microcomputer topics. He and his wife operate a word processing firm in Colorado Springs, for which he is a self-taught programmer in Z80 assembly code. During a seven-year stint in government and politics in the 1970's, he was administrative assistant to the board of county commissioners of El Paso County, then elected to the board, serving twice as the county's highest elected official. His computer "bulletin board service" is accessible via 300-baud modem at (303) 574-1615.

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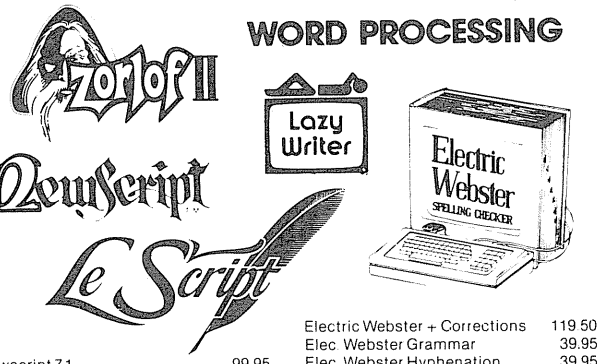

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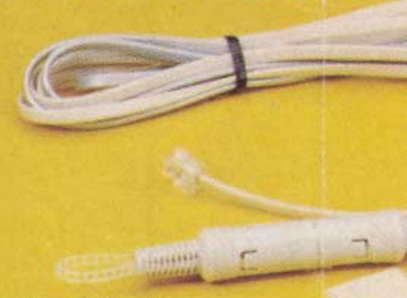

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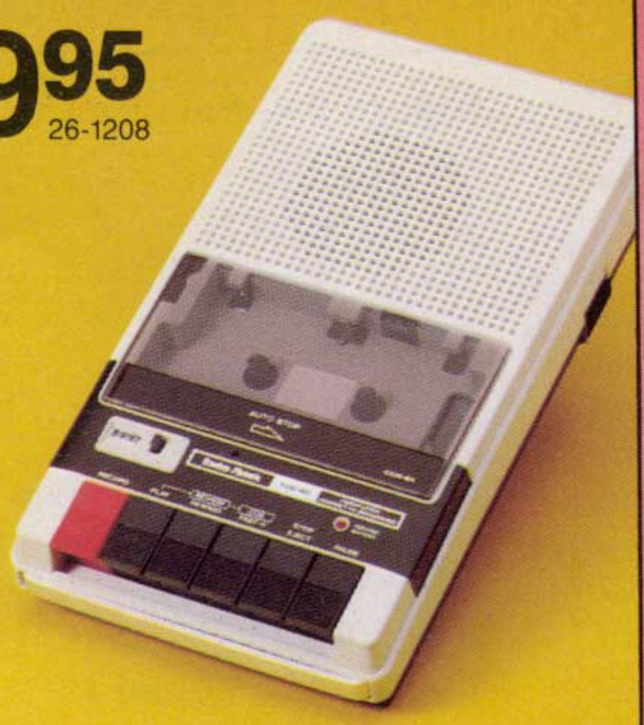

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This program enables you to enter important specific dates and occasions that you will need to remember for each month of the 1984 year. It will print a hardcopy of each month with your personalized reminders displayed below the appropriate monthly calendar. It is set to print out large-size characters on the Tandy LPVII (DMP 100).

The Program

Lines 10000 through 10016 and 12000 through 12015 initialize the variables and provide opening comments. Line 10020 accepts an input of the number associated with a specific month (i.e., June is the 6th month) and branches to the appropriate nine-line subprogram. For June, this is lines 10090 through 10099. The same format is used for each month. Line xxxx0 prints the name of the month, the year, and goes to a subroutine to print the letters of the days of the week. The xxxx5 line prints the first week of the month and then goes to a subroutine to print the rest of the weeks for that month, except the last week. The first and last weeks of various months start and end on various days of the week, but the middle weeks are all seven days long.

The xxxx6 line prints the last week for that month. It also checks for a flag which will be set when your dates and occasions have been entered for that month. Line xxx7 provides the opportunity to input three dates and occasions as strings. The program returns to the menu to give you a chance to see the final results before you line print it.

Line xxxx8 displays the month on the screen and also gives the opportunity to print a hardcopy of that month. Line xxxx9 returns you to the menu to personalize another month.

The line-print routine at lines 12505 through 12515 should work on most printers. If you are using a Model III, you can substitute the screen print command, CMD "Z," "ON." Be sure to reset the flag with CMD "Z," "OFF" after the printout occurs. Also, in line 12500, some printers may not recognize CHR$ (31) and will use a different code to print the calendar with large characters.

Modifications

You can add more input strings in line xxxx7 for any month that requires more than three reminders. Be sure to change line xxxx8 to print the added strings. If, as the year progresses, you need to add reminders to any month, rerun the main program, update the information, and print just that particular month.

The high line numbers were utilized so that the program could be merged to any other program that might need quick reference to the 1984 monthly calendar. Either use a GOSUB...RETURN mechanism or BREAK the main program and enter RUN 10000 or GOTO 10000.

Figure 1 — Program Variables

JJ	The 37 possible PRINT @ locations for the numbers of days on the calendar
DD(JJ)	Array of these locations
F1-F9,A,B	Flags set for each month when occasions are entered
T%	Time loops
QQ$	Temporary storage for Y/N inputs
GM	Number of the selected month
ZQ$	Screen print variable

Figure 2 — Sample Printout

```
          JANUARY 1984
    S    M    T    W    T    F    S
    1    2    3    4    5    6    7
    8    9   10   11   12   13   14
   15   16   17   18   19   20   21
   22   23   24   25   26   27   28
   29   30   31
10TH REGISTRATION FOR CLASSES
16TH CLASSES BEGIN
=====> 26TH - WIFE'S BIRTHDAY <=====
```

Listing 1 — Model I/III/4 Version

```
1 CLS:GOSUB10000
3 REM A PERSONALIZED CALENDAR FOR 1983 B
Y A. MANDELL, PORTSMOUTH, VA.
10000 PRINTCHR$(23);:PRINT@260,"THE 1984
 CALENDAR" :PRINT@452,"MONTH BY MONTH":G
OSUB12015:CLS
10001 ' COMPILED BY ALAN MANDELL, PORTSM
OUTH,VA.
10002 GOSUB12000
10003 DEFINT D,G,I,J:I=1:CLEAR 2000:DIM
DD(37):YR$="1984"
10004 IP$="INPUT UP TO 3 DATES AND OCCAS
IONS (PRESS <ENTER> FOR NO INPUT)"
10005 JA$="JANUARY":FB$="FEBRUARY":MR$="
MARCH":AP$="APRIL":MY$="MAY":JU$="JUNE":
```


Refer to advertiser index for reader service number

```
JY$="JULY":AG$="AUGUST":SP$="SEPTEMBER":
OC$="OCTOBER":NV$="NOVEMBER":DC$="DECEMB
ER"
10010 FORJJ=1TO37:READ DD(JJ):NEXT
10011 DATA 131,135,139,143,147,151,155
10012 DATA 195,199,203,207,211,215,219
10013 DATA 259,263,267,271,275,279,283
10014 DATA 323,327,331,335,339,343,347
10015 DATA 387,391,395,399,403,407,411
10016 DATA 451,455
10020 ZQ$="":CLS:INPUT"ENTER THE NUMBER
OF THE MONTH YOU WISH TO SEE. ENTER '13'
 TO END";GM:CLS:I=1:ONGMGOSUB10040,10050
,10060,10070,10080,10090,10100,10110,101
20,10130,10140,10150,10160
10025 PRINT@898,"WHEN YOU WISH TO CLEAR
THIS MONTH PRESS ANY KEY"
10030 KY$=INKEY$:IFKY$="" GOTO10030: ELS
E CLS:GOTO10020
10040 PRINT@8,JA$,YR$
10041 GOSUB10500
10045 FORJJ=DD(1)TODD(7)STEP4:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11000
10046 FORJJ=DD(29)TODD(31)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IF F1=1GOTO10048
10047 PRINT:PRINTIP$:INPUT"";JA$(1):INPU
T"";JA$(2):INPUT"";JA$(3):F1=1:GOSUB1102
0:GOTO10020
10048 PRINT:PRINTJA$(1):PRINTJA$(2):PRIN
TJA$(3);:GOSUB11025
10049 QQ$="":CLS:GOTO10020
10050 PRINT@8,FB$;" ";YR$:GOSUB10500
10055 FORJJ=DD(4)TODD(7)STEP4:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10056 PRINT@DD(29),26;:PRINT@DD(30),27:P
RINT@DD(31),28;:PRINT@DD(32),29;:IFF2=1G
OTO10058
10057 PRINT:PRINTIP$:INPUT"";FB$(1):INPU
T"";FB$(2):INPUT"";FB$(3):F2=1:GOSUB1102
0:GOTO10020
10058 PRINT:PRINTFB$(1):PRINTFB$(2):PRIN
TFB$(3);:GOSUB11025
10059 QQ$="":CLS:GOTO10020
10060 PRINT@8,MR$,YR$:GOSUB10500
10065 FORJJ=DD(5)TODD(7)STEP4:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10066 FORJJ=DD(29)TODD(35)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IF F3=1GOTO10068
10067 PRINT:PRINTIP$:INPUT"";MA$(1):INPU
T"";MA$(2):INPUT"";MA$(3):F3=1:GOSUB1102
0:GOTO10020
10068 PRINT:PRINTMA$(1):PRINTMA$(2):PRIN
TMA$(3);:GOSUB11025
10069 QQ$="":CLS:GOTO10020
10070 PRINT@8,AP$,YR$:GOSUB10500
10075 FORJJ=DD(1)TODD(7)STEP4:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10076 FORJJ=DD(29)TODD(30)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFF4=1GOTO10078
10077 PRINT:PRINTIP$:INPUT"";AP$(1):INPU
T"";AP$(2):INPUT"";AP$(3):F4=1:GOSUB1102
0:GOTO10020
10078 PRINT:PRINTAP$(1):PRINTAP$(2):PRIN
TAP$(3);:GOSUB11025
10079 CLS:GOTO10020
10080 PRINT@8,MY$,YR$:GOSUB10500
10085 FORJJ=DD(3)TODD(7)STEP4:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11000
10086 FORJJ=DD(29)TODD(33)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFF5=1GOTO10088
10087 PRINT:PRINTIP$:INPUT"";MY$(1):INPU
```

Model 100 calendar

Lyndon B. Mitchell, Honolulu, HI

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```
10 'CALEND.BA 830707
11 'Lyndon B. Mitchell 94-1041 Mahua
Place Honolulu Hi 96797 808-671-4878
12
L$="312831303130313130313031":YY=VAL
(MID$(DATE$,7,2))+1900:M=VAL(MID$(
DATE$,1,2)):IFM=0THENMENU
13 CLS:Y=YY-1901:L=INT((YY/4-INT(YY/
4))*4+.5):D=Y*365+INT(Y/4)+
1:IFM=1THEN15
14 FORI=1TOM-1:D=D+VAL(MID$(L$,I*2-
1,2)):NEXT:IFL<>0THEN16
15 IFM>2THEND=D+1
16 W=INT((D/7-INT(D/7))*7+.5)+
1:PRINTTAB(16);MID$(
"JANFEBMARAPRMAYJUNJULAUGSEPOCTNOVDE
C",M*3-2,3);YY:PRINTTAB(6);"SUN MON
TUE WED THU FRI SAT":PRINTTAB(6+W*4)
;
17 FORI=1TOVAL(MID$(L$,M*2-1,2)):P=I
+W-1:IFP/7=INT(P/7)
THENPRINT:PRINTTAB(6);
18 IFI<10THENPRINTCHR$(32);
19 PRINTI;:NEXT:IFL<>0THEN21
20 IFM=2THENPRINT" 29";
21 K$=INKEY$:IFK$=""THEN21ELSEIFASC(
K$)=77THENMENUEELSEIFASC(K$)<30ORASC
(K$)>31THEN21
22 IFASC(K$)=30THENM=M+1:IFM>
12THENM=1:YY=YY+1
23 IFASC(K$)=31THENM=M-1:IFM<
1THENM=12:YY=YY-1
24 GOTO13
```

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Calendars

```
T"";MY$(2):INPUT"";MY$(3):F5=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1ØØ88 PRINT:PRINTMY$(1):PRINTMY$(2):PRIN
TMY$(3);:GOSUB11Ø25
1ØØ89 CLS:GOTO1ØØ2Ø
1ØØ9Ø PRINT@8,JU$,YR$:GOSUB1Ø5ØØ
1ØØ95 FORJJ=DD(6)TODD(7)STEP4:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11ØØØ
1ØØ96 FORJJ=DD(29)TODD(35)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFF6=1GOTO1Ø098
1ØØ97 PRINT:PRINTIP$:INPUT"";JU$(1):INPU
T"";JU$(2):INPUT"";JU$(3):F6=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1ØØ98 PRINT:PRINTJU$(1):PRINTJU$(2):PRIN
TJU$(3);:GOSUB11Ø25
1ØØ99 CLS:GOTO1ØØ2Ø
1Ø1ØØ PRINT@8,JY$,YR$:GOSUB1Ø5ØØ
1Ø1Ø5 FORJJ=DD(1)TODD(7)STEP4:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11ØØØ
1Ø1Ø6 FORJJ=DD(29)TODD(31)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFF7=1GOTO1Ø1Ø8
1Ø1Ø7 PRINT:PRINTIP$:INPUT"";JY$(1):INPU
T"";JY$(2):INPUT"";JY$(3):F7=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1Ø1Ø8 PRINT:PRINTJY$(1):PRINTJY$(2):PRIN
TJY$(3);:GOSUB11Ø25
1Ø1Ø9 CLS:GOTO1ØØ2Ø
1Ø11Ø PRINT@8,AG$,YR$:GOSUB1Ø5ØØ
1Ø115 FORJJ=DD(4)TODD(7)STEP4:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11ØØØ
1Ø116 FORJJ=DD(29)TODD(34)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFF8=1GOTO1Ø118
1Ø117 PRINT:PRINTIP$:INPUT"";AU$(1):INPU
T"";AU$(2):INPUT"";AU$(3):F8=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1Ø118 PRINT:PRINTAU$(1):PRINTAU$(2):PRIN
TAU$(3);:GOSUB11Ø25
1Ø119 QQ$="":CLS:GOTO1ØØ2Ø
1Ø12Ø PRINT@8,SP$;" ";YR$:GOSUB1Ø5ØØ
1Ø125 JJ=DD(7):PRINT@JJ,I:I=I+1:GOSUB11Ø
ØØ
1Ø126 FORJJ=DD(29)TODD(35)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:PRINT@DD(36),3Ø;:IFF9=1GO
TO1Ø128
1Ø127 PRINT:PRINTIP$:INPUT"";SP$(1):INPU
T"";SP$(2):INPUT"";SP$(3):F9=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1Ø128 PRINT:PRINTSP$(1):PRINTSP$(2):PRIN
TSP$(3);:GOSUB11Ø25
1Ø129 QQ$="":CLS:GOTO1ØØ2Ø
1Ø13Ø PRINT@8,OC$,YR$:GOSUB1Ø5ØØ
1Ø135 FORJJ=DD(2)TODD(7)STEP4:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11ØØØ
1Ø136 FORJJ=DD(29)TODD(32)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFFØ=1GOTO1Ø138
1Ø137 PRINT:PRINTIP$:INPUT"";OC$(1):INPU
T"";OC$(2):INPUT"";OC$(3):FØ=1:GOSUB11Ø2
```

```
Ø:GOTO1ØØ2Ø
1Ø138 PRINT:PRINTOC$(1):PRINTOC$(2):PRIN
TOC$(3);:GOSUB11Ø25
1Ø139 QQ$="":GOTO1ØØ2Ø
1Ø14Ø PRINT@8,NV$;" ";YR$:GOSUB1Ø5ØØ
1Ø145 FORJJ=DD(5)TODD(7)STEP4:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11ØØØ
1Ø146 FORJJ=DD(29)TODD(34)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:IFFA=1GOTO1Ø148
1Ø147 PRINT:PRINTIP$:INPUT"";NV$(1):INPU
T"";NV$(2):INPUT"";NV$(3):FA=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1Ø148 PRINT:PRINTNV$(1):PRINTNV$(2):PRIN
TNV$(3);:GOSUB11Ø25
1Ø149 QQ$="":GOTO1ØØ2Ø
1Ø15Ø PRINT@8,DC$;" ";YR$:GOSUB1Ø5ØØ
1Ø155 JJ=DD(7):PRINT@JJ,I:I=I+1:GOSUB11Ø
ØØ
1Ø156 FORJJ=DD(29)TODD(35)STEP4:PRINT@JJ
,I;:I=I+1:NEXT:PRINT@DD(36),3Ø;:PRINT@DD
(37),31;:IFFB=1GOTO1Ø158
1Ø157 PRINT:PRINTIP$:INPUT"";DC$(1):INPU
T"";DC$(2):INPUT"";DC$(3):FB=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1Ø158 PRINT:PRINTDC$(1):PRINTDC$(2):PRIN
TDC$(3);:GOSUB11Ø25
1Ø159 QQ$="":GOTO1ØØ2Ø
1Ø16Ø PRINT:PRINT"END":END
1Ø5ØØ PRINTTAB(4)"S";TAB(8)"M";TAB(12)"T
";TAB(16)"W";TAB(2Ø)"T";TAB(24)"F";TAB(2
8)"S":RETURN
11ØØØ FORJJ=DD(8)TODD(14)STEP4:PRINT@JJ,
I;:I=I+1:NEXT
11Ø05 FORJJ=DD(15)TODD(21)STEP4:PRINT@JJ
,I;:I=I+1:NEXT
11Ø1Ø FORJJ=DD(22)TODD(28)STEP4:PRINT@JJ
,I;:I=I+1:NEXT
11Ø15 RETURN
11Ø2Ø PRINT@896,"NOW REENTER ";GM;" TO S
EE IF THE CALENDAR IS CORRECT";:FORT%=1T
O25ØØ:NEXT:RETURN
11Ø25 PRINT@896,"DO YOU WISH A HARDCOPY
OF THIS MONTH (Y/N)";:INPUT"";QQ$:IFQQ$=
"Y"GOTO125ØØ
11Ø3Ø CLS:RETURN
12ØØØ PRINT:PRINT"YOU CAN INPUT IMPORTAN
T DATES TO REMEMBER FOR EACH MONTH."
12ØØ5 PRINT:PRINT"YOU CAN ALSO PRINT OUT
 A HARDCOPY OF EACH MONTH AND ITS
  REMINDERS TO HANG ON YOUR WALL.":FORT%
=1TO2ØØØ:NEXT
12Ø1Ø PRINT:PRINT"IF YOU STILL FORGET YO
UR ANNIVERSARY - ITS NOT YOUR
  COMPUTER'S FAULT * * *"
12Ø11 PRINT@896,"PRESS SPACE BAR TO BEGI
N";
12Ø12 KY$=INKEY$:IFKY$<>" "GOTO12Ø12
```


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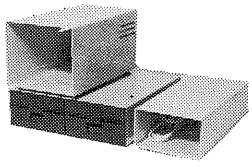

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```
12013 RETURN
12015 FORT%=1TO15ØØ:NEXT:RETURN
125ØØ QQ$="":PRINT@768,CHR$(31);:LPRINTC
HR$(31)
125Ø5 FORX=1536ØTO16255STEP64:ZQ$=""
1251Ø FORY=ØTO63:ZQ$=ZQ$+CHR$(PEEK(X+Y))
12515 NEXTY:LPRINTTAB(4) ZQ$:NEXTX
1252Ø ZQ$="":GOTO1ØØ2Ø
```

Listing 2 — Color Computer Version

```
1 CLS:GOSUB1ØØØØ
1Ø42 GOTO 1Ø42
1Ø56 PRINT@DD(29),26;:PRINT@DD(3Ø),27:PR
INT@DD(31),28;:PRINT@DD(32),29;:IFF2=1GO
TO1ØØ58
1ØØØØ PRINT@135,"THE 1984 CALENDAR":PRIN
T@199,"MONTH BY MONTH":GOSUB 12Ø15:CLS
1ØØØ2 GOSUB 12ØØØ
1ØØØ3 CLEAR 2ØØØ:I=1:DIM DD(37):YR$="198
4"
1ØØØ4 IP$="INPUT UP TO 3 DATES & OCCASIO
NS (PRESS <ENTER> FOR NO INPUT)"
1ØØØ5 JA$="JANUARY":FB$="FEBRUARY":MR$="
MARCH":AP$="APRIL":MY$="MAY":JU$="JUNE":
JY$="JULY":AG$="AUGUST":SP$="SEPTEMBER":
OC$="OCTOBER":NV$="NOVEMBER":DC$="DECEMB
ER"
1ØØ1Ø FOR JJ=1TO37:READ DD(JJ):NEXT
1ØØ11 DATA 65,68,71,74,77,8Ø,83
1ØØ12 DATA 97,1ØØ,1Ø3,1Ø6,1Ø9,112,115
1ØØ13 DATA 129,132,135,138,141,144,147
1ØØ14 DATA 161,164,167,17Ø,173,177,18Ø
1ØØ15 DATA 193,196,199,2Ø2,2Ø5,2Ø8,211
1ØØ16 DATA 225,228
1ØØ2Ø ZQ$="":CLS:INPUT"ENTER THE NUMBER
OF THE MONTH   YOU WISH TO SEE. ENTER '1
3' TO  END";GM:CLS:I=1:ON GM GOSUB 1ØØ4Ø
,1ØØ5Ø,1ØØ6Ø,1ØØ7Ø,1ØØ8Ø,1ØØ9Ø,1Ø1ØØ,1Ø1
1Ø,1Ø12Ø,1Ø13Ø,1Ø14Ø,1Ø15Ø,1Ø16Ø
1ØØ25 PRINT @448,"WHEN YOU WISH TO CLEAR
 THIS     MONTH PRESS ANY KEY";
1ØØ3Ø KY$=INKEY$:IFKY$=""GOTO1ØØ3Ø:ELSE
CLS
1ØØ4Ø PRINT @2,JA$;TAB(17)YR$
1ØØ41 GOSUB 1Ø5ØØ
1ØØ45 FORJJ=DD(1) TO DD(7) STEP 3:PRINT@
JJ,I:I=I+1:NEXT:GOSUB11ØØØ
1ØØ46 FORJJ=DD(29)TODD(31)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IF F1=1GOTO1ØØ48
1ØØ47 PRINT:PRINTIP$:INPUT"";JA$(1):INPU
T"";JA$(2):INPUT"";JA$(3):F1=1:GOSUB11Ø2
Ø:GOTO1ØØ2Ø
1ØØ48 PRINT:PRINTJA$(1):PRINTJA$(2):PRIN
TJA$(3):F1=1:GOSUB11Ø25
1ØØ5Ø PRINT@2,FB$;TAB(17)YR$:GOSUB1Ø5ØØ
1ØØ55 FORJJ=DD(4)TODD(7)STEP3:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11ØØØ
```

```
10056 PRINT@DD(29),26;:PRINT@DD(30),27:P
RINT@DD(31),28;:PRINT@DD(32),29;:IFF2=1G
OTO10058
10057 PRINT:PRINTIP$:INPUT"";FB$(1):INPU
T"";FB$(2):INPUT"";FB$(3):F2=1:GOSUB1102
0:GOTO10020
10058 PRINT:PRINTFB$(1):PRINTFB$(2):PRIN
TFB$(3);:GOSUB11025
10059 QQ$="":CLS:GOTO10020
10060 PRINT@2,MR$;TAB(17)YR$:GOSUB10500
10065 FORJJ=DD(5)TODD(7)STEP3:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10066 FORJJ=DD(29)TODD(35)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFF3=1GOTO10068
10067 PRINT:PRINTIP$:INPUT"";MA$(1):INPU
T"";MA$(2):INPUT"";MA$(3):F3=1:GOSUB1102
0:GOTO10020
10068 PRINT:PRINTMA$(1):PRINTMA$(2):PRIN
TMA$(3);:GOSUB11025
10069 QQ$="":CLS:GOTO10020
10070 PRINT@2,AP$;TAB(17)YR$:GOSUB10500
10075 FORJJ=DD(1)TODD(7)STEP3:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10076 FORJJ=DD(29)TODD(30)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFF4=1GOTO10078
10077 PRINT:PRINTIP$:INPUT"";AP$(1):INPU
T"";AP$(2):INPUT"";AP$(3):F4=1:GOSUB1102
0:GOTO10020
10078 PRINT:PRINTAP$(1):PRINTAP$(2):PRIN
TAP$(3);:GOSUB11025
10079 CLS:GOTO10020
10080 PRINT@2,MY$;TAB(17)YR$:GOSUB10500
10085 FORJJ=DD(3)TODD(7)STEP3:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11000
10086 FORJJ=DD(29)TODD(33)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFF5=1GOTO10088
10087 PRINT:PRINTIP$:INPUT"";MY$(1):INPU
T"";MY$(2):INPUT"";MY$(3):F5=1:GOSUB1102
0:GOTO10020
10088 PRINT:PRINTMY$(1):PRINTMY$(2):PRIN
TMY$(3);:GOSUB11025
10089 CLS:GOTO10020
10090 PRINT@2,JU$;TAB(17)YR$:GOSUB10500
10095 FORJJ=DD(6)TODD(7)STEP3:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11000
10096 FORJJ=DD(29)TODD(35)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFF6=1GOTO10098
10097 PRINT:PRINTIP$:INPUT"";JU$(1):INPU
T"";JU$(2):INPUT"";JU$(3):F6=1:GOSUB1102
0:GOTO10020
10098 PRINT:PRINTJU$(1):PRINTJU$(2):PRIN
TJU$(3);:GOSUB11025
10099 CLS:GOTO10020
10100 PRINT@2,JY$;TAB(17)YR$:GOSUB10500
10105 FORJJ=DD(1)TODD(7)STEP3:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10106 FORJJ=DD(29)TODD(31)STEP3:PRINT@JJ
```


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```
,I;:I=I+1:NEXT:IFF7=1GOTO10108
10107 PRINT:PRINTIP$:INPUT"";JY$(1):INPU
T"";JY$(2):INPUT"";JY$(3):F7=1:GOSUB1102
0:GOTO10020
10108 PRINT:PRINTJY$(1):PRINTJY$(2):PRIN
TJY$(3);:GOSUB11025
10109 CLS:GOTO10020
10110 PRINT@2,AG$;TAB(17)YR$:GOSUB10500
10115 FORJJ=DD(4)TODD(7)STEP3:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10116 FORJJ=DD(29)TODD(34)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFF8=1GOTO10118
10117 PRINT:PRINTIP$:INPUT"";AU$(1):INPU
T"";AU$(2):INPUT"";AU$(3):F8=1:GOSUB1102
0:GOTO10020
10118 PRINT:PRINTAU$(1):PRINTAU$(2):PRIN
TAU$(3);:GOSUB11025
10119 QQ$="":CLS:GOTO10020
10120 PRINT@2,SP$;TAB(17)YR$:GOSUB10500
10125 JJ=DD(7):PRINT@JJ,I:I=I+1:GOSUB110
00
10126 FORJJ=DD(29)TODD(35)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:PRINT@DD(36),30;:IFF9=1GO
TO10128
10127 PRINT:PRINTIP$:INPUT"";SP$(1):INPU
T"";SP$(2):INPUT"";SP$(3):F9=1:GOSUB1102
0:GOTO10020
10128 PRINT:PRINTSP$(1):PRINTSP$(2):PRIN
TSP$(3);:GOSUB11025
10129 QQ$="":CLS:GOTO10020
10130 PRINT@2,OC$;TAB(17)YR$:GOSUB10500
10135 FORJJ=DD(2)TODD(7)STEP3:PRINT@JJ,I
;:I=I+1:NEXT:GOSUB11000
10136 FORJJ=DD(29)TODD(32)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFF0=1GOTO10138
10137 PRINT:PRINTIP$:INPUT"";OC$(1):INPU
T"";OC$(2):INPUT"";OC$(3):F0=1:GOSUB1102
0:GOTO10020
10138 PRINT:PRINTOC$(1):PRINTOC$(2):PRIN
TOC$(3);:GOSUB11025
10139 QQ$="":GOTO10020
10140 PRINT@2,NV$;TAB(17)YR$:GOSUB10500
10145 FORJJ=DD(5)TODD(7)STEP3:PRINT@JJ,I
:I=I+1:NEXT:GOSUB11000
10146 FORJJ=DD(29)TODD(34)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:IFFA=1GOTO10148
10147 PRINT:PRINTIP$:INPUT"";NV$(1):INPU
T"";NV$(2):INPUT"";NV$(3):FA=1:GOSUB1102
0:GOTO10020
10148 PRINT:PRINTNV$(1):PRINTNV$(2):PRIN
TNV$(3);:GOSUB11025
10149 QQ$="":GOTO10020
```


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```
10150 PRINT@2,DC$;TAB(17)YR$:GOSUB10500
10155 JJ=DD(7):PRINT@JJ,I:I=I+1:GOSUB110
00
10156 FORJJ=DD(29)TODD(35)STEP3:PRINT@JJ
,I;:I=I+1:NEXT:PRINT@DD(36),30;:PRINT@DD
(37),31;:IFFB=1GOTO10158
10157 PRINT:PRINTIP$:INPUT"";DC$(1):INPU
T"";DC$(2):INPUT"";DC$(3):FB=1:GOSUB1102
0:GOTO10020
10158 PRINT:PRINTDC$(1):PRINTDC$(2):PRIN
TDC$(3);:GOSUB11025
10159 QQ$="":GOTO10020
10160 PRINT:PRINT"END":END
10500 PRINTTAB(2)"S";TAB(5)"M";TAB(8)"T"
;TAB(11)"W";TAB(14)"T";TAB(17)"F";TAB(20
)"S";:RETURN
11000 FOR JJ=DD(8)TODD(14)STEP3:PRINT@JJ
,I;:I=I+1:NEXT
11005 FORJJ=DD(15)TODD(21)STEP3:PRINT@JJ
,I;:I=I+1:NEXT
11010 FORJJ=DD(22)TODD(28)STEP3:PRINT@JJ
,I;:I=I+1:NEXT
11015 RETURN
11020 PRINT@448,"NOW REENTER ";GM;" TO S
EE IF THE  CALENDAR IS CORRECT";:FORT=1
TO2500:NEXT:RETURN
11025 PRINT@416,"DO YOU WISH A HARDCOPY
OF THIS  MONTH (Y/N)";:INPUT"";QQ$:IFQQ$
="Y"GOTO12500
11030 CLS:RETURN
12000 PRINT:PRINT"YOU CAN INPUT IMPORTAN
T DATES TOREMEMBER FOR EACH MONTH."
12005 PRINT:PRINT"YOU CAN ALSO PRINT OUT
 A":PRINT"HARDCOPY OF EACH MONTH AND ITS
":PRINT"REMINDERS TO HANG ON YOUR WALL."
:FOR T=1 TO 2000:NEXT
12010 PRINT:PRINT"IF YOU STILL FORGET YO
UR":PRINT"ANNIVERSARY - ITS NOT YOUR":PR
INT"COMPUTER'S FAULT * * *"
12011 PRINT:PRINT"PRESS SPACE BAR TO BEG
IN"
12012 KY$=INKEY$:IFKY$<>" "GOTO 12012
12013 RETURN
12015 FOR T=1 TO 1500:NEXT:RETURN
12500 QQ$=""
12505 FORX=1024TO 1408STEP32:ZQ$=""
12510 FORY=0TO31:M=PEEK(X+Y)
12512 IF M=96 OR M>100 THEN M=M-64
12514 ZQ$=ZQ$+CHR$(M)
12515 NEXTY:PRINT#-2,TAB(4):PRINT#-2,ZQ$
:NEXTX
12520 ZQ$="":GOTO10020
```


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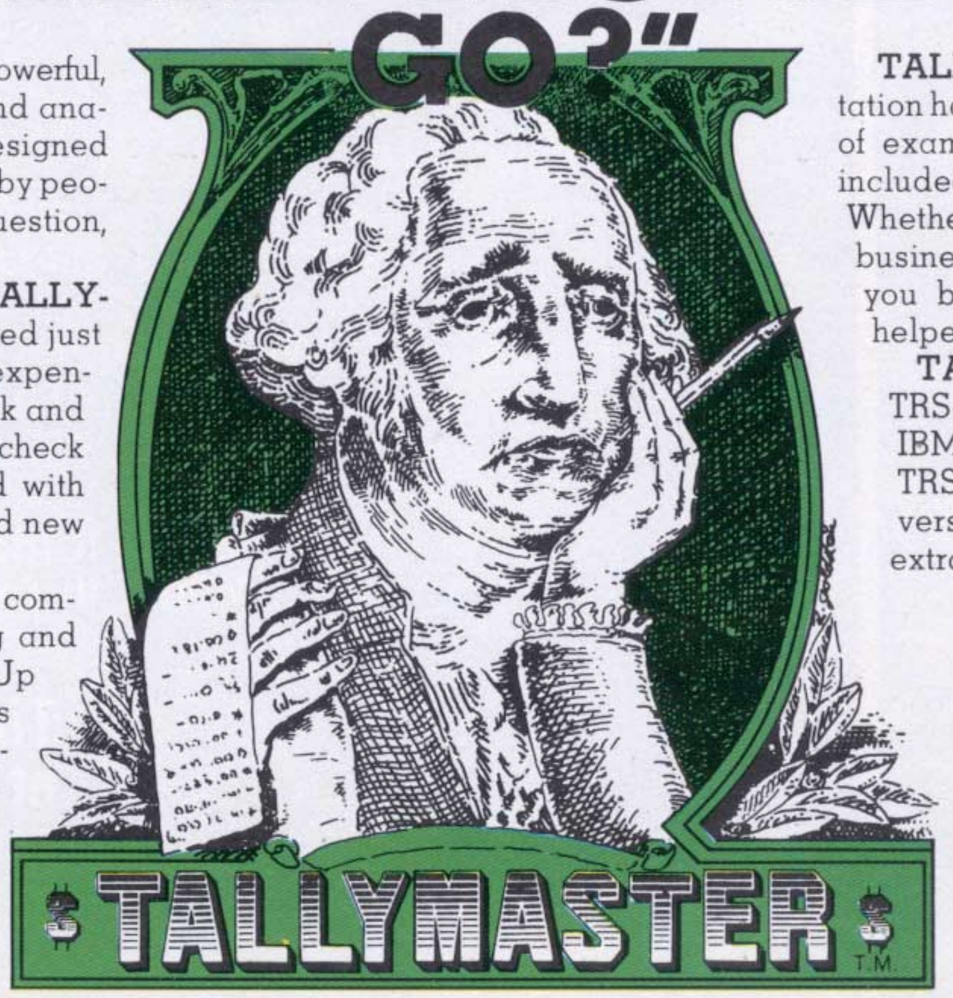

TALLYMASTER's handsome documentation has a step-by-step tutorial, with dozens of examples and illustrations. We've even included five sample disk files for you. Whether you're managing a home budget or business expenses, this program can give you better understanding and control. It helped us, and it can help you.

TALLYMASTER is available for the TRS-80 Models I and III (48K) and the IBM Personal Computer (128K). The TRS-80 version is just $79.95. The IBM version, with functional keys and an extra-fast sort, is just $129.95.

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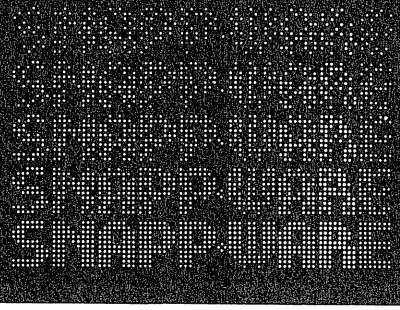

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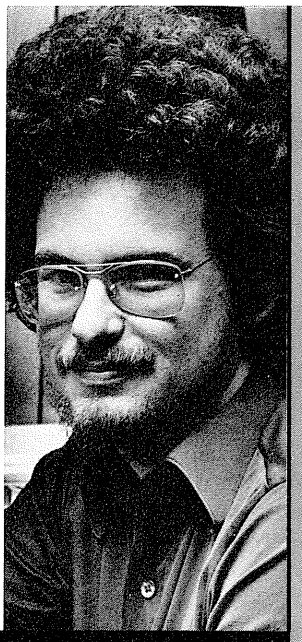

The Snappware College Educated Garbage Collector (SNAPP-VI) is an intelligent processing function which greatly improves performance of typical BASIC applications. And here's why.

Microsoft uses a 'variable length string' in the BASIC interpreter. Each time the string is assigned a new value, it is relocated in a string pool. Periodically the string pool must be reorganized and condensed into a single contiguous area. Performing this string space reclamation is time consuming and inefficient because this approach evaluates and collects each string individually. The time required is roughly proportional to the square of the number of active strings in the resident program. During reclamation the system seems to 'lock-up' and does not respond to the operator until the process is completed.

This time consuming approach requires a better solution. Snappware has developed a solution which takes advantage of the auxiliary memory available. SNAPP-VI requires only four bytes per active string as a work area. When free storage space is available, our system temporarily borrows, uses and returns the space to the free storage pool when completed. If storage is not available, our system will temporarily transfer out to disk enough of the BASIC program to make room for our work area and return the 'paged out' information to its correct location when completed.

Benchmarked times show, in some situations, SNAPP-VI performs one hundred times as fast as the Microsoft approach.

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General ledger software

A comparison of two sophisticated business packages

Models II/12/16

Elizabeth McDonald, Kirkland, WA

How big is your company? How many transactions do you enter in your general ledger each month? Each year? Do you have company divisions that need to be looked at separately, as well as the company as a whole? Will you need more than one entry station to enter all of your data? Will one person, working for only two hours in the afternoon, be enough? If you add another program later, such as accounts receivable, how will your requirements change?

There are many questions to be looked at when selecting the software package that will best fit your requirements. This article compares the features of the Radio Shack General Ledger Three-disk system (Radio Shack #26-4501) for the Model II, 12 and 16 to the International Software Sales, Inc.'s (ISSI) General Ledger System.

The purpose of a general ledger system, whether computerized or not, is to generate accounting reports that show the company's economic position and the yearly change in that position. Two main report forms are utilized -- the balance sheet and the profit and loss statement.

A balance sheet shows the total assets of the company, liabilities, and capital or owner equity. The profit and loss statement shows the change in monetary position during the period (usually one year). Profit and loss statements also display each account as a percentage of the total income. This allows the company to see how much income was used in each expenditure category.

Entries are made (posted) in a list (journal) each time there is income and outgo by the company. Each entry is credited to one file and debited in another. For instance, a rent payment would be debited to the rent account and credited to the cash-in-the-bank account. This balancing of accounts is critical. Each entry must be posted to two accounts and the accounts must balance at the end of each day and each period.

At the end of the period, the accounts are all added together (trial balance) to make sure all entries have been made properly. Only then are any necessary reports prepared. The period is marked "finished" (closed) and all new entries are marked in the new period's books. At the end of the year, these same procedures are followed. Books are cleared for the new year and totals in the profit and loss accounts are transferred to capital or equity accounts.

If data files can be kept separate from the program disk, more than one company could use the same program (just the data disk would be changed). This might be useful in an accounting office where a number of companies could be using the same system.

There are, however, several things you must be careful of when using a computer. Making daily and monthly backups is critical. Once posted, each entry is not erasable. If it is wrong, you will have to make at least two adjusting entries to correct it. During the set-up process, forethought is necessary. You must insure that all accounts are exactly the ones needed and that they are numbered properly. Once set up, changing account types or numbers is difficult.

Table 1 Relative Capacities

	Radio Shack		ISSI	
	#Accts	#Entries	#Accts	#Entries
Model II/12 floppy use	300	4300	400	5000+
Model II/12 hard disk	9999	many	1200	unlimited

The Packages

The ISSI package is available in floppy or hard disk versions. The Model II, 12, 16 (Model II mode) floppy-disk package sells for $995. It is fully interactive with ISSI's payroll, A/R, and A/P programs. It also includes a telecommunications package for remote use of the data files. A hard disk version is sold for $1395 and it includes the hard disk operating system HSDS from Racet Computes. ISSI does not recommend using TRSDOS 4.x with their package.

Radio Shack sells their general ledger programs in two versions. The lowest-priced is $199 for the Model II and 12 floppy-disk version. A fully-interactive version that works with their payroll, A/R, and A/P programs sells for $399. A Model 16 version of the general ledger sells for $599. Radio Shack also offers a Xenix version. In this review only the general ledger programs were studied. I did not investigate their interaction with other software.

For Model II floppy disk operation, the payroll, A/R, and A/P programs from Radio Shack sell for $399, $299, and $299 respectively. Model II floppy disk payroll, A/R, and A/P programs from ISSI sell for $800, $600, and $600, respectively. The ISSI payroll package includes job costing.

There are no major differences in the capacities of these two programs, as used for one company.

Refer to advertiser index for reader service number

The Radio Shack program keeps all data on one disk and this disk may be changed if more than one company uses the computer. The ISSI program would require an entirely separate set of disks. With disk operation, ISSI's program has the advantage of up to seven separate companies on one disk. The Radio Shack program is limited to one company by its internal file-labeling procedures.

Table 1 shows the relative capacities of each package. However, the set-up procedures of either program can limit the capacity. In the ISSI program, there is a limit of 700 accounts with a Model II floppy disk system. Because of their method of setting up financial sheets, some of these accounts are used as headings for the various account types. Thus, having fewer than 300 money accounts is recommended. I doubt that this would be a major problem since any company requiring that many accounts would probably also require much greater disk storage capacity. ISSI reports one hard disk user easily keeping track of 700 accounts and 500 budget accounts as well as over 1200 entries per month.

Powering Up

Disk in hand, I was sitting in front of a Model 12 with the ISSI program. According to the manual, I tried the command ISSI, making sure that I had an empty TRSDOS disk. It all loaded and even progressed to the main menu.

ISSI's speed of pulling a program into the computer is faster than Radio Shack's, and their report sorts are also quite fast. I didn't care for the ISSI main menu. Sequencing was not in the order of the most-used items first and there were 13 items on the menu. I appreciated Radio Shack's four-to five-item menus and the use of a hierarchy of menus for different levels of use. They have set-up and maintenance on a menu separate from daily entries and reports.

Starting the Programs

Use of a password is required in the ISSI program and each person is given his own password. Radio Shack's program only requires that the operator have some knowledge of how to get into the system.

ISSI also has a "Help menu" which will explain each feature and screen to the user. It is a nice feature if you have forgotten something, but not a replacement for the manual. The ISSI program also has the ability to print on paper whatever is on the screen at any point in the program. This can be used to print a hard copy of an account whenever it is needed.

Periods are already set up in the ISSI program in monthly, quarterly, and yearly increments. The Radio Shack program gives you the ability to set your own periods, but only a total of 13 periods are available. With their program, you could use a monthly and yearly cycle; closing each month and then again at the end of the year. Or, you could close at the end of each quarter and at the end of the year. If you are a small operation that uses this program only to satisfy bank and accounting requirements, closing and making reports only four times yearly might be quite satisfactory.

The posting format for both programs is similar. Two entries are written for each item, one credit and one debit, leaving a balance of zero. This net is shown on the screen of each program as proof of balance. Along with the actual accounts, each program allows a budget file to be set up for comparison to the actual figures.

ISSI adds two more features to their package. They include two small calculation programs for computing depreciation and amortization. The depreciation program allows a company to make a list of its assets and run a yearly list of their depreciation. By entering three of the four numbers needed (interest rate, amount of loan, number of periods, and number of payments) the amortization program will calculate the missing number and give you the payment total. These utilities can be handy.

Error trapping was very good with

the ISSI program. Because of passwords and such roadblocks, I was constantly being returned to the main menu until I figured it all out. Radio Shack's program operates without a password. I did get into problems once with their program when setting up the financial reports. I tried to designate placement of text before I had written it in the program. However, during normal operation I never experienced any problems.

Daily Operation

An exact procedure for the daily operation of the system is important. This helps to make entry more accurate and prevents the loss of data. After setting up the accounts with the year-to-date and period-to-date totals, items are entered on a daily (or nearly daily) basis. Radio Shack's program allows you to enter all items and run a transaction checklist to insure their accuracy. At this point, transactions may be changed or modified until they are correct. Only then are they posted to the general ledger. A list of posted material is generated.

On the other hand, the ISSI package posts each item as it is entered and a posting report is printed. But the secondary checkpoint is bypassed and there is no easy method of changing the entries.

The ISSI program has the ability to generate a check printed from a single designated account, usually the cash-in-the-bank account. However, the general ledger program must be in use at the time to enter the data and generate the check. For writing a check it is not too convenient, especially with all the printing procedures involved in closing off the program.

Entry of items for posting seemed easy for both programs and I have no complaints for either one. Both had a very good search procedure for a particular account or item. Radio Shack had better checks for accuracy and if it was caught on the same day it was entered, mistakes were easy to change. Period change-over was easier with the ISSI report since there was a menu item for the move. Radio Shack relied on a manual change from the maintenance menu. Reports on both programs were easy to run.

End-of-period Reports

With the Radio Shack program, at the end of the period (month or quarter), a current period transaction report is printed. This lists all entries to all accounts within the month. A working trial balance is printed so you can check the balancing of accounts and the accuracy of the totals. Then a trial balance is printed as well as any other reports that are required. Before changing the period, the Radio Shack general ledger gives you the option of compressing the data to save disk space.

The ISSI program uses a more abbreviated procedure that allows for the printing of accounts that were designated as "special" during their initial entry. A trial balance and any other necessary reports are printed and the period is changed. No data compression is allowed. If you run out of room, you can only buy a hard disk to increase your capacity.

There are major differences between these two programs when it comes to report generation. The ISSI general ledger has its report forms embodied within the the program code. Pre-planning is essential in setting up the order of the accounts since this will also determine the order in which they are printed. The setting up of the Radio Shack accounts can be done as desired. Their financial reports are set up in a separate step. The method used to set up the reports is complicated and not well explained in the manual, but it does allow more flexibility in formatting the reports and gives you the ability to tailor the reports to your company's needs.

Each package will print a chart of accounts, listing the accounts by number and name, balance sheet, and profit and loss statements. The charts are useful during data entry.

The ISSI report format allows balance sheet and profit and loss statements using monthly, quarterly, or yearly periods. You may also select data for one department, or all departments, thus allowing divisions within a company to be seen separately or as a whole. You may designate one special group of accounts to be seen separately as well. During the set-up of a report, you may also request that comparisons to the prior year, to sales income, or to budgeted income be included.

Radio Shack's program, because of its report format ability, allows any special report to be easily printed once it is set up. This method does allow you to print a change-in-financial-position sheet or a cash flow sheet that compares to last year's along with the usual balance sheet and profit and loss statement.

The Manuals

The Radio Shack manual was more complete, although it was quite a pedantic volume. Plowing through the pages of information on each item was time consuming. ISSI lost me more than once by failing to note how they had reached a particular screen in the program. ISSI did have an excellent Executive Summary in the back which gave an overview of operations. It is good for the user who does not need the finer details of setting up and use. The summary was what finally pulled program operation together for me.

Which One to Buy?

In my opinion, the Radio Shack program is a better buy for most uses. Though it is initially harder to set up, it allows greater flexibility in reports and formats. It has a much nicer menu hierarchy and levels of various uses are well-defined.

ISSI offers a distinct advantage for an accounting firm or an office with several separate accounts. They could all be handled on one hard disk at one time. The depreciation and amortization reports could be a boon to companies who carry inventories of assets, or to a firm that is constantly servicing loans. For most small-sized companies, the Radio Shack package would do quite nicely, at a reasonable price.

The Radio Shack General Ledger package is available at all Computer Center Stores.

The ISSI General Ledger is available by contacting ISSI, International Software Sales, Inc., P.O. Box 11-278, Albany, NY, 12211, (518) 271-6825.

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Exploring VisiCalc

Setting printer format codes

Models I/II/III/4/12/16

Timothy K. Bowman, Spokane, WA

I have received a number of letters requesting how it is possible to configure a printer to print a VisiCalc worksheet in a particular manner. The most common request is to set the printer to print in the compressed mode.

Many VisiCalc users have been confused by the instructions on how to send the printer the necessary control codes and have resorted to an alternate setup procedure. This type of solution involves first, sending the printer the control code from BASIC using a command like LPRINT CHR$(15) to print in compressed print on an Epson MX80, and then loading VC and printing the necessary copies. The problem comes when you happen to reset the printer and your carefully set control code is erased! You must then save the spreadsheet you are working on, exit to your operating system, load BASIC, run the appropriate LPRINT command, exit BASIC, load VisiCalc, load your spreadsheet, and print it. Whew! That's a lot of work.

Doing It from VisiCalc

Fortunately, there is an easier way. It's quick, painless, and I'll show you how you can use changeable printer control codes to spruce up your printed spreadsheets. Before I describe the technique, I need to emphasize one fact. Although this command sequence works on all printers, the specific codes may or may not work on your printer. In order to most effectively use this article, I recommend that you consult your printer manual for its specific control codes and have that manual open and use the control codes for your specific printer while you use this description. Figure 2 is an abbreviated list of the control codes for two popular dot matrix printers: the Radio Shack LPVIII and the Epson MX80 with Graftraxplus.

The Regular Way

Figure 1 is a very simple heading that we will use to illustrate how to directly send your printer control codes from VisiCalc. To get started, type it in and save it. In order to print it, you would normally turn on your printer, type the command sequence /PP and answer the lower right prompt request by typing E3 and pressing enter, or moving the cursor to E3 and pressing enter. Try doing this and you should see that this three-line heading is printed out in regular size type.

Squeezing It Down

Assuming that we would like to print it out in compressed type, let's send the necessary control codes to the printer. Position the cursor at position A1 and type the command sequence /PP. When you receive the prompt, Lower Right, "Setup, - or &; type a - (minus sign). This will instruct the printer to print in single spacing. Then, type a " (quote mark, or shifted 2). Don't be alarmed by the message on the command line, "Set up string or ENTER." If you have one of the two printers mentioned above, consult the control code chart in Figure 2 and find the hexadecimal code for compressed print. For the Epson, it's 0F (zero F); for the LPVIII, it's 1B 14.

First, we'll assume that you have an Epson printer. Type SHIFT@ HOF. The SHIFT@ will produce a carat figure and the H tells the printer that the next characters are hexadecimal. Now, press enter, type E3, and press enter. You should see your printer print the heading in compressed print. Assuming you have an LPVII, after you type the minus sign, type a quote mark (shifted 2) SHIFT@H1BSHIFT@14, press enter, type E3, and press enter again. Compressed print should result.

It is important to note that for all of the above control codes, you *must* type using capital letters. Lowercase will not be recognized by your printer! There also must be no

Figure 1

```
      A         B          C                D          E          F

1                        "Sample Co "mpany
2               "          I "ncome Sta "tement
3             "For the T "hree Year "s Ended D "ecember 3 "1, 1983
```

Figure 2
Sample Printer Control Codes

	Epson		LPVIII	
	Dec	Hex	Dec	Hex
Start Compressed Print	015	0F	027 020	1B 14
End Compressed Print	018	12	027 019	1B 13
Start Elongated Print	014	0E	027 014	1B 0E
End Elongated Print	020	14	027 015	1B 0F

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spaces between each of the characters.

Getting Larger

Let's explore some more. Reset your printer by turning it off and then on again, or pressing the printer's reset key. (Yes, I know there is another way to reset it, but let's not confuse ourselves any more than we have to.) An effective way to present spreadsheets is to print the first line of the heading in large print and the body of the spreadsheet in regular, or compressed print. Again, it's easily done. To select elongated print, consult the chart in Figure 2, or your printer manual.

For the Epson, the necessary code is 0E (zero E) hexadecimal. For the LPVIII, it is 1B 0E hexadecimal. Position your cursor in cell position B1 (note that it is not A1). Type the familiar command sequence /PP-"SHIFT@H followed by the necessary control codes: 0E for the Epson or 1BSHIFT@0E for the LPVII, press enter, type E1, and press enter. You should see the heading print out line one in large print.

In order to turn off the large print, position the cursor in line cell position B2, press /PP and type in the now-familiar sequence of codes to shut off the large print as found in Figure 2. They are 14 hexadecimal for the Epson and 0F hexadecimal for the LPVIII. Answer the cursor position request with enter (no cursor movement at all).

Fine Tuning

Why did we start printing in B1? Try experimenting by starting the /PP sequence in cell positions A1 to C1. You'll have to decide which you like best in your particular situation.

By now, you should be quite comfortable with sending your printer its control codes without using BASIC. Let's consider some of the finer points of sending your printer control codes. Whenever your printer requires a control code to be sent, each of the characters or codes must be preceded by a caret (SHIFT@).

Second, you must generally work in hexadecimal notation. That shouldn't be too difficult as most printer control charts include the hexadecimal notation for the necessary control codes.

Third, a common control code used by many printers is the escape code (1B hexadecimal). Instead of typing SHIFT@H1B, you can shortcut that by typing SHIFT@E. VisiCalc translates that and sends it to your printer as an escape code.

Fourth, you can send multiple control codes in the same printer control code string as long as you separate them with the SHIFT@. If that is confusing, send individual control codes.

Last, certain control codes can have "unpredictable results." Really, they are not unpredictable. They are just not well documented. Try printing out a full spreadsheet in elongated print on your printer. You probably will get the first line in large print and the remaining lines will default to another print size.

Getting Fancy

Now that you have mastered the art of sending your printer its control codes from VisiCalc, you open up all sorts of new possibilities for enhancing your printed reports. A key one, I mentioned earlier: print the first line in large print and the remaining lines in compressed or regular print. Print your headings in multiple print fonts and multiple line spacings. If you like true underlining for columns, print your spreadsheet down to, but not including, the line you want underlined. Send your printer the start underline code, print the line you want underlined, send the code to turn off the underline and print the remainder of the sheet. Unfortunately, this won't work with the LPVIII because it underlines from the left margin. It will, however, work with the Epson and with the Daisy Wheel II.

I hope the above description of sending control codes to your printer has been of help. If you have a question concerning the use of printer control codes, or any other VisiCalc-related topic, write to me in care of *Basic Computing*. Be sure to describe your system and enclose a list of the printer control codes that your printer requires, and a SASE for a prompt reply. Keep exploring.

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Files and foibles

Tracking physical and logical records

For all models

Terry R. Dettmann, Associate editor

I really appreciate the letters, good and bad, that I've been getting about the articles I've written. I've been traveling quite a bit lately and haven't been able to sit down and write answers to some of the questions I've received. This article is an attempt to cover some of them.

Quite a bit of the mail I've received asked about adapting my Model II Profile II and II+ routines to the Model III's Profile III+. Tim Bowman answers that question in this same issue. Be sure to see his article entitled Accessing Profile III+ files from BASIC.

I've also received a lot of mail about my Profile II articles that show how to use BASIC to make custom programs that use Profile data bases. One of the questions that keeps coming up is, "How I can deal with the first segment records of Profile since there are three logical records in each physical record?"

This turns out to be one of the simplest parts of the BASIC program. Record packing is something computer people have been doing with magnetic tapes for years. The key to reading these records is to read the correct record and index it by the 85 character size of the logical records. The methods and routines given here will work even if you don't have or use Profile. Since the questions came from Profile users, I will tailor the discussion around that program. Keep in mind, Listing 1 and this article do not require you to know Profile.

For Profile II, segment 1 records are 85 characters long, each in a 256-byte physical record. This means that we can have three logical records for each physical record (3 X 85 = 255, leaving 1 extra byte that is not used). If I look at physical record number 1, logical records number 1, 2, and 3 are stored there. Reading physical record number 2, I get logical records 4, 5, and 6. You can write this out mathematically. If I read out physical record N, I get logical records 3*(N-1)+1, 3*(N-1)+2, and 3*(N-1)+3.

Table 1

PRN	LRN's
1	1,2,3
2	4,5,6
3	7,8,9

If we use PRN to stand for physical record number, and LRN for logical record number, we can write out a conversion equation which gives us the first logical record in any physical record:

LRN = 3*(PRN-1)+1

The other two logical records are simply the next two in order. Try Listing 1 to see how it works.

Usually, we don't start with the physical record number. We know what logical record we want (e.g. Profile record number 380) and we want to find it in the file. To do that, just turn the equation around to get:

PRN = (LRN-1)/3+1

If we're looking for the first record in a group of three, this tells us its physical record number. But what about the other two records?

If we could reduce the problem to finding the location of the first record in a set of three, we'd have the physical record and we could just offset to get the logical record. That's exactly the way it's done!

To get the first record number in a set of three, consider this problem. If I have to get at record number 5, I already know that it's the second record in physical record 2. The first record is 4. To let the computer find this in general, notice one thing; the last record in each physical record is evenly divisible by three (3, 6, 9, 12, . . .). This means that the first record is always 1 greater than a number that is evenly divisible by three.

If I take the record number (5) and divide it by 3 I get 1.6666.... I throw away the fraction leaving only 1. The last logical record of the last physical record is this number times three. So, the first record of the record I'm in is 3*1+1 or four! The way I get the physical record number is to get the first record number.

This works great for the first and second records of the set, but for the last record it fails. Think about record 6; divide it by 3 and get 2, add a 1 and get 3. But logical record 6 is in physical record 2, not 3! See Table 1.

Notice that record six gives me an answer for the next record. Use this by dropping each record number by one before dividing by three:

FIRST = 3*INT((N-1)/3)+1

This is the first record of a group of three. From this we can get the physical record. But look! This looks like what we already had for the number of the physical record that the first record is in:

PRN = (LRN-1)/3 + 1

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If we use what we have for the LRN of the first record, we get:
PRN = (3*INT((LRN-1)/3)+1-1)/3+1

I can make that formula simpler by letting the +1-1 cancel to 0 and letting the 3* and the /3 cancel to give 1. I get:
PRN = INT((LRN-1)/3)+1
Neat, huh! I guess I'm just turned on by simple things.

How do I know which of the three logical records in the physical record is the one I want? To get that, I need a number that cycles from one to three as I count. It should look like Table 2.

To get this counter, we can use a math function that the Model II provides called the modulus (MOD). If I give it a series of numbers, it cycles from zero to two with three as its base. In other words, I get what is shown in Table 3.

The modulus is simply the remainder after division by the number called the base. If I write this out (for machines that don't have a MOD function), I get:
MOD = N - 3*INT(N/3)

Now, Table 3 is pretty good, but that zero is in the wrong place. If the zero occured at 1, 4, 7, and so forth, I could just add 1 and get the location. To get that effect, try the modulus of the number N-1. See Table 4.

Table 2

N	Number
1	1
2	2
3	3
4	1
5	2
6	3
7	1
8	2
9	3

Table 3

N	N MOD 3
1	1
2	2
3	0
4	1
5	2
6	0

Table 4

N	N-1	(N-1)MOD3
1	0	0
2	1	1
3	2	2
4	3	0
5	4	1
6	5	2

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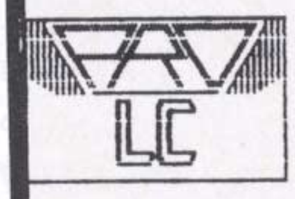

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So, I can get the location of the record I want by computing:
LOCATION = (PRN-1)MOD3+1
If you don't have a Model II, you do it like this:
LOCATION = (PRN-1)-3*INT((PRN-1)/3)

Putting the record back requires a little more care. If I make a change in a logical record that is packed with other records, I want to make sure that they aren't changed when I change the one I am working on.

To insure that I don't change the information I already have, I have to first make a copy of the record I want to change in the buffer. Make the changes to the record I want, then rewrite all three logical records back out together.

This sounds complicated, but it is really very simple. Assume I'm working with only the first segment of a Profile file. If I want to get a particular record called RN, I could write a subroutine like this:

```
2000 REM GET RECORD RN
2010 GOSUB 2100
2020 GET 1,PRN
2030 IN$=DA$(LRN)
2040 RETURN
2100 REM FIGURE PRN & LRN
2110 LRN = (RN-1)MOD3 + 1
2120 PRN = INT((RN-1)/3) + 1
2130 RETURN
```

I have assumed that file number 1 is the Profile segment 1 (extension '/KEY') and that it is fielded like this:

```
FIELD 1,85 AS DA$(1), 85 AS DA$(2), 85 AS DA$(3)
```

By setting RN to the record number we want, this will return the contents of that record as IN$.

When we're ready to put a record back, (assuming that the 85 characters are IN$ and the record number is RN), we could have the subroutine:

```
2200 REM Put record RN back
2210 GOSUB 2100
2220 IF RN<=LOF(1) THEN GET1,RN
2230 LSET DA$(LRN)=IN$
2240 PUT1,RN
2250 RETURN
```

Notice line 2220. If the record already exists in the file, this line brings it into memory so it can be changed. Only the part of the physical record that needs to be changed is modified. Then it is written back to the file.

By following this sequence of steps, it is easy to write programs that can use the Profile file structure to do the dirty work of data base manipulation. At the same time, it allows you to customize improvements to meet your own needs. The next installment will carry this further with a program to read and modify a Model II Profile data base.

Listing 1

```
10 REM-------------------------------
20 REM
30 REM  record numbers, physical
40 REM          and logical
50 REM
60 REM-------------------------------
200 REM-------------------------------
210 CLS:PRINT"Physical/Logical Records"
215 REM    ENTER A LINE IN THE FORM:
216 REM        L1-10
220 PRINT:PRINT"Enter data in the form L
1-10":LINE INPUT"(L/P) range: ";IN$
230 GOSUB1000:IF EF=1 THEN PRINT"ERROR":
GOTO220
240 FOR I=ST TO SP
250   IF RT$="L" OR RT$="1" THEN GOSUB 2
000 ELSE GOSUB 3000
260 NEXT I
270 INPUT"Press ENTER to run again";A$:G
OTO 210
1000 REM------ parse input line --------
1003 REM      SET UP AN ERROR FLAG
1005 EF=0
1008 REM      GET THE LEFT MOST CHARACTE
R
1010 RT$=MID$(IN$,1,1)
1015 REM      ERROR IF IT ISN'T 'L' OR '
R'
1020 IF RT$<>"1" AND RT$<>"L" AND RT$<>"
p" AND RT$<>"P" THEN EF=1:RETURN
1025 REM      REST OF LINE SHOULD BE RAN
GE
1030 IN$=MID$(IN$,2):GOSUB1100
1040 RETURN
1100 REM------- range parse ----------
1105 REM      FIRST NUMBER ON LINE IS ST
ARTING POINT
1110 ST=VAL(IN$)
1115 REM      LOOK FOR A DASH, IF THERE
1116 REM      IS NONE, THEN STOPPING POI
NT
1117 REM      IS THE SAME AS STARTING PO
INT
1120 L=INSTR(IN$,"-"):IF L=0 THEN SP=ST:
RETURN
1125 REM      IF THERE IS A STOPPING POI
NT
1126 REM      THEN GET IT
1130 SP=VAL(MID$(IN$,L+1)):RETURN
2000 REM------ cycle over logical ------
2010 LRN=I:GOSUB2100
2020 PRINTUSING"LRN: #####  PRN: #####";
LRN,PRN
2030 RETURN
2100 REM-------- prn given lrn ---------
2110 PRN=INT((LRN-1)/3)+1:RETURN
3000 REM------ cycle over physical -----
3010 PRN=I:GOSUB3100
3020 PRINTUSING"PRN: ###  LRN: ### ### #
##";PRN,LRN,LRN+1,LRN+2
3030 RETURN
3100 REM-------- lrn given prn ---------
3110 LRN=3*(PRN-1)+1:RETURN
```


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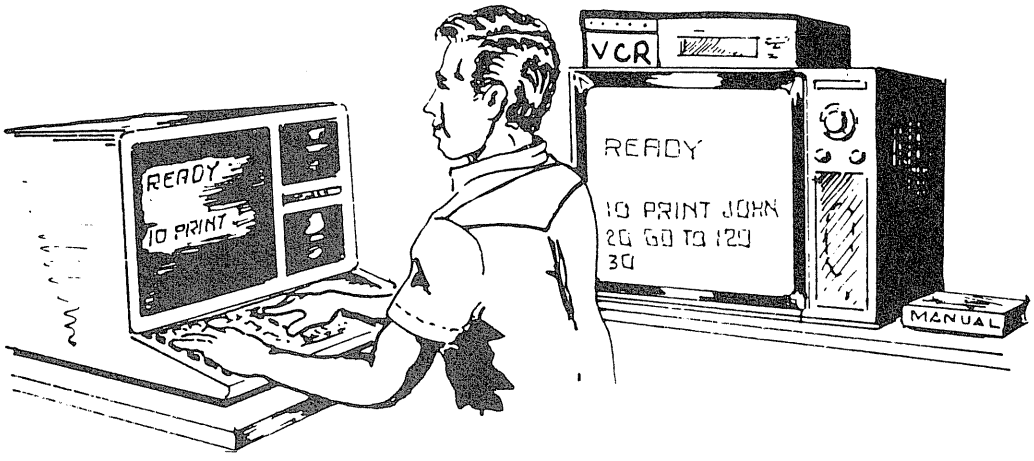

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Computer ease

What is an operating system?

For all readers

Mark E. Renne, Bozeman, MT

Since it's Christmas time and you've all been good boys and girls, I've decided to hand out a present to my faithful readers. A few years back, a fellow named Jim Brennan and I wrote a short booklet called "Chester the Chip." It's an electronic version of the pet rock. If you send me a computer-related question and a stamped (40 cents, please), self-addressed envelope, I'll send you this classic humorous piece of literature. Merry Christmas! They are in limited supply, so order before midnight tomorrow.

Down to business. This month's column is about operating systems. We'll look at some popular operating systems for Radio Shack computers including CP/M. Since space is limited, I can't do a review of each, but I'll cover the major features. As always, if you have questions about computers, please send them to me in care of *Basic Computing.*

What is an operating system?

The operating system (OS for short) is the master program for any computer. We tend to associate OS's only with disk systems, but you should realize that every computer must have an operating system. In computers without disks, the OS is stored in ROM (Read Only Memory) and cannot be changed by the user. This program, whether on disk or in ROM, gives the computer its personality.

Personality?

The OS serves as the interface between you and your computer. Every operation that the computer performs is controlled by the OS. It's responsible for taking data from place to place within the computer and even outputting it to the screen for you to read. Many people will form opinions about a computer's value based totally on its operating system. A bad operating system can make even the best computer difficult to use.

How does an operating system work?

Simply put, the operating system serves as a traffic cop within the computer. Let's say you want to add two numbers together. First, the operating system takes the numbers from the input device, usually the keyboard, and stores them in memory. The OS then sends them to the Central Processing Unit (CPU) where they're added together. The sum is taken by the OS and stored in memory, and output to the screen where you read the result. It's amazing just how much work the OS is doing at any one time.

I thought ROM BASIC added numbers together.

That's true. However, in the strict sense, ROM BASIC (that BASIC which comes as part of your computer) is simply another part of the OS. Most OS's use the BASIC within the computer for a number of functions. On tape systems, the BASIC comprises almost all of the OS.

What's TRSDOS?

Tandy Radio Shack Disk Operating System (TRSDOS) is the standard OS of all Radio Shack disk-based computers. It is aimed at beginners and is extremely easy to use. Many users find TRSDOS the only OS they'll ever need. Also, a great number of programs are written to be run under TRSDOS. Its only disadvantage is that it's not written for programmers. This has spawned a number of different OS's that run on Radio Shack computers.

What other OS's?

Some of the major competitors in the Model I/III/4 market are NEWDOS, MULTIDOS, LDOS and DOSPLUS. These all run on unmodified Radio Shack computers. CP/M can also run on these models, but it requires a hardware change for the Models I/III. For the Model II/12/16 folks, there's DOSPLUS. Even the Color Computer has an alternative called Flex, and more recently, OS9.

Why another OS?

Let's look at some history. Back in the Model I days, Radio Shack introduced the first TRSDOS. It would be an understatement to call TRSDOS 1.0 an inferior OS. Outside vendors saw a chance to improve TRSDOS and provide users with a better OS. Hence, came the DOS wars. Radio Shack has since improved TRSDOS and it now is one of the finest for beginners. Each of the other OS's offer a unique set of features not found in TRSDOS that can be valuable to programmers.

Why NEWDOS?

NEWDOS/80 version 2.0 is the latest version of an OS from Apparat, Inc. NEWDOS was one of the first OS's to compete with TRSDOS and it has undergone many revisions. It has all of the features of TRSDOS and surpasses it with many more. It comes with an editor/assembler to develop machine language programs and a disassembler to "decode" machine language programs. I won't go into detail here about these since, if you need them, you know what they are.

NEWDOS also includes a printer spooler which allows you to use your computer while it's printing. You can also use NEWDOS to transfer tapes to disk. Updating NEWDOS is easy using its SUPERZAP utility to change the OS. NEWDOS also is a very flexible OS when it comes to odd-sized or mixed configuration of disk drives. TRSDOS does not support 8-inch drives, but NEWDOS does. It also features a number of

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enhancements to BASIC to make life easier.

Why MULTIDOS?

MULTIDOS has the ability to read from, and write to, many of the major DOS's avilable for the Radio Shack Models I/III. If you use more than one OS, MULTIDOS can greatly ease the transfer of files and programs. You can also use MULTIDOS to read single-density diskettes in a double-density drive. This ability to read different DOS's is quite incredible and no other OS can match MULTIDOS in this feature.

MULTIDOS also includes a print spooler and a number of BASIC enhancements. I think the best part of SUPERBASIC is its single-step function. This allows you to trace a program line-by-line as it runs. You can examine variables at any time to make sure they are what they should be. Programs can also be easily renumbered and program lines moved within the program. This BASIC is great! I only wish it could become a standard. There's also an even more enhanced graphics BASIC called EBASIC available as an option.

Why DOSPLUS?

DOSPLUS is the closest to TRSDOS in form and function. It is sold to a number of vendors in its kernel (abbreviated) version. This means there are a number of programs ready to run under DOSPLUS. It can be configured for a number of disk drives including hard disks. It, too, has a printer spooler and can read TRSDOS files.

A virtual-device feature allows you to JOIN devices together. In simple terms, you could send all screen information to your printer or to a disk file. This is very handy for a number of applications. A disk editor is also included to easily modify either DOSPLUS or any of your disks. There are two BASICS included with DOSPLUS — an enhanced BASIC and a memory-efficient TBASIC. The first is an improved version of standard BASIC while TBASIC is great for long programs that require few special functions.

Why LDOS?

LDOS is not an operating system for the weak of heart. It is a very sophisticated operating system designed for programmers. Radio Shack paid Logical Systems, Inc. a high compliment by choosing LDOS as the first authorized non-Radio Shack OS. In fact, TRSDOS 6.0 for the Model 4 is a version of LDOS. LDOS has a great number of features and utilities that will appeal to those who desire a "programmer's" operating system.

I think two of the nicest features of LDOS are its Job Control Language and Filter commands. The JCL (Job Control Language) is normally found on large mainframe computers. It allows you to create a file that contains a series of instructions for the operating system or a program. For those familiar with TRSDOS, it's much like an expanded BUILD file. This frees you from actually having to be at the computer while the program is running. If you have a program that takes awhile to sort, you could create a file to begin the program, sort the files, and then backup the new data. This "batching" ability is easy to get used to and hard to live without.

The Filter command allows you to modify data before it passes to the device you specify. Whew, I love it when I talk like that! The idea is that you could "filter out" any characters that would be unacceptable to your printer. Perhaps you would change brackets to parentheses. You could also use the filter to set right and left margins. LDOS comes with a number of useful filters. It also comes with a terminal program and an enhanced BASIC.

What's CP/M?

CP/M is the most popular operating system for 8-bit microcomputers. Some people speak of it almost as a language, but it is an OS. The Radio Shack Model II has CP/M available as a software package, but the Models I/III must also have a hardware modification. Radio Shack has also made CP/M an optional operating system for its new Model 4.

Is CP/M the best OS?

You'll note that I said CP/M was the most *popular* system, not the best. CP/M is made to work with many different computers, so it does not take advantage of any special features of a certain computer. For example, the arrow keys on the Model III are not used the same way under CP/M as they are under TRSDOS. CP/M is also a very simple OS and not very sophisticated. TRSDOS has many features not found in CP/M.

Isn't CP/M the "universal" operating system?

Yes, and no. CP/M is not a single operating system. It has several versions and is written for specific processors. Some people will tell you that any CP/M program will run on any computer under CP/M. This just ain't so! For example, IBM CP/M-86 VisiCalc will not run under CP/M-80 on a TRS-80. If, however, you have the same microprocessor and the same version of CP/M, you can run the same program on your computer as someone else. This ability makes CP/M extremely popular.

The operating system is the most critical part of your computer. TRS-80 owners are quite fortunate to have so many operating systems available. We can have inexpensive and easy-to-use TRSDOS programs or CP/M to join us to the rest of the computer world. The TRS-80 can grow with you by simply adding a more advanced operating system. I would like to thank those OS vendors that helped with this column. Let me add that this is in no way a complete list of operating systems.

Next month, we'll talk about printers. Remember, learning to understand computers is easier than you think. Happy computing.

For more information on the products mentioned in this column, contact the following vendors:

TRSDOS, Radio Shack, One Tandy Center, Fort Worth, Texas 76101.

NEWDOS/80 version 2.0, Apparat, Inc., 4401 South Tamarac Parkway, Denver, Colorado 80237.

MULTIDOS, Cosmopolitan Electronics Corporation, P.O. Box 234, Plymouth, Michigan 48170.

DOSPLUS, Micro-Systems Software, Inc., 4301-18 Oak Circle, Boca Raton, FL 33431.

LDOS, Logical Systems, Inc., P.O. Box 23956, Milwaukee, Wisconsin 53223.

In the chips

Embedding machine code in BASIC

Models I/III/4

Spencer Hall, Associate editor

If all you ever write are BASIC programs, your work can be greatly improved by a familiarity with simple machine language techniques. There are endless things which can be done in BASIC using embedded object code. The BASIC program in Listing 2 is a simple example of what I mean. Just three of these nine BASIC statements (you can discount my remarks) provide a machine language subroutine which fills the screen with consecutive bytes from anywhere in memory.

You should remember that the Model I/III/4 screens each contain 1024 bytes. The assignment was to write a BASIC program which dumps RAM into a full screen, starting from an address specified by the user and then advance automatically to the next 1024 bytes. It could be done with a FOR . . . NEXT statement using PEEK and POKE, but there would be a dreary wait while the screen filled. Change line 80 to read as follows:

```
80 SA=15360:FOR J=N TO
N+1023:POKE SA, PEEK(J):SA=
SA+1:NEXT
```

Run this version and you'll see what I mean.

Readers of this column will remember that the Z-80 source instruction, LDIR, provides a way of doing this in a fraction of a second. Before embedding such a routine in BASIC, we first write and assemble the machine code. Using EDTASM, or a similar TRS-80-based Z-80 assembler, enter the code shown in Listing 1. Leave out all remarks. They're just there to help explain what we're doing. Let's put the code at decimal address 28672, which (in hexadecimal) is a nice round number, 7000H. This isn't really necessary, as we'll see in a moment, but EDTASM needs an ORG. We can pass this starting address from BASIC. How this is done is shown in the notes which you won't enter. The BASIC listing contains the Level II version of this instruction. For a

Listing 1 — In the Chips

```
                00100 ;         ***** MEMORY-TO-SCREEN DUMP *****
                00110 ;             for IN THE CHIPS, Part 10
                00120 ; NOTE:   The address to start dumping, specified by the
                00130 ;         user as N, was passed to this routine from
                00140 ;         BASIC using one of these statements:
                00150 ;              X=USR(N)      - Non-disk systems
                00160 ;              DEFUSR1=N     - Disk systems
                00170 ;         The CALL 0A7FH places this address in the HL
                00180 ;         register as required by LDIR
7000            00190           ORG     7000H           ;Start at 28672 decimal
7000 CD7F0A     00200           CALL    0A7FH           ;Value from BASIC into HL
7003 11003C     00210           LD      DE,3C00H        ;First screen address
7006 010004     00220           LD      BC,400H         ;1024 screen addresses
7009 EDB0       00230           LDIR                    ;Dump memory to screen
700B C9         00240           RET                     ;Go back to BASIC program
0000            00250           END
00000 TOTAL ERRORS
```


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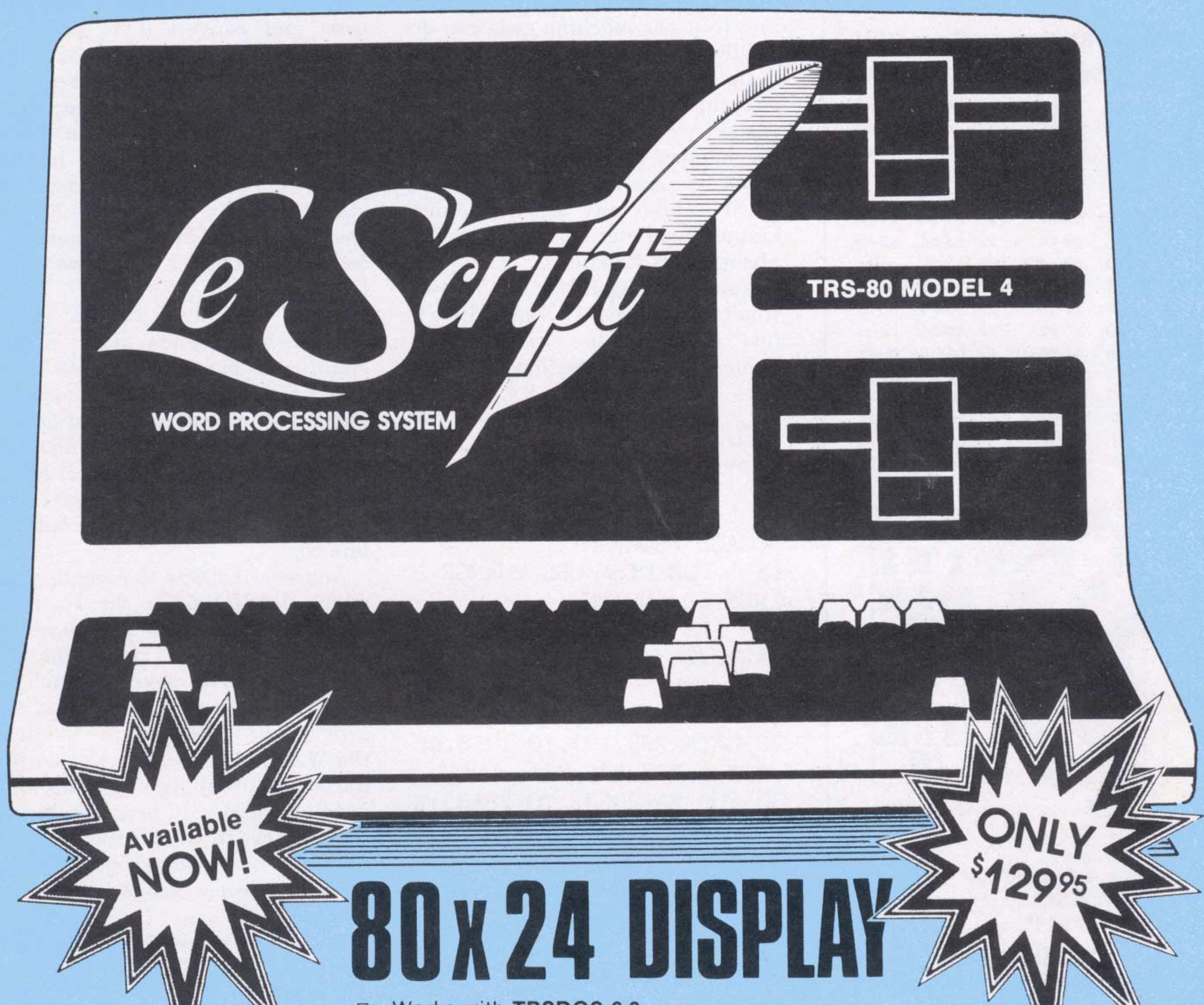

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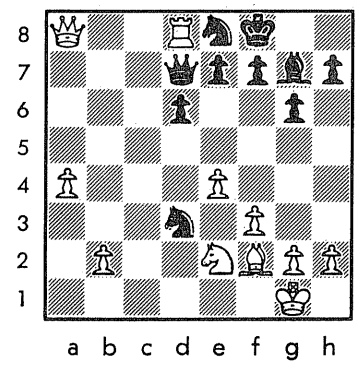
2.	g1-f3	d7-d6	18.	d3-c2	e5-c4
3.	d2-d4	c5-d4	19.	e3-f2	b5-b4
4.	f1-b5+	c8-d7	20.	c2-b3	a6-a5
5.	b5-d7+	d8-d7	21.	d1-d4!	b7-b5
6.	f3-d4	g8-f6	22.	c3-b4	a5-b4
7.	b1-c3	g7-g6	23.	a1-c1!	c4-b6
8.	e1-g1	f8-g7	24.	c1-c8+	b6-c8
9.	c1-e3	e8-g8	25.	b3-c4	b5-d7
10.	d1-d3	a7-a6	26.	c4-b4	c8-a7
11.	c3-d5	b7-b5?	27.	b4-b8+	f6-e8
12.	d5-b6	d7-b7	28.	d4-c4	a7-c6
13.	b6-a8	b7-a8	29.	b8-a8	c6-e5
14.	f2-f3	b8-d7	30.	c4-c8	g8-f8
15.	f1-d1	f8-c8	31.	a2-a4	e5-d3
16.	c2-c3	a8-b7	32.	c8-d8!	resigns



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disk system, change lines 50 and 80 as noted in the remarks in Listing 2. Either version places the requested value in an "old oak tree" known to the BASIC operating system.

Our first object code statement is a call to ROM which picks up this number and puts it into HL. Note that this value has to be an integer, and that our machine code can do anything with it our heart may desire. Since we already got our HL with this ROM call, all we need to do is specify our destination in DE and the number of bytes in BC. After LDIR, we are ready to go back to BASIC. Like any good machine language subroutine, this is accomplished with RET(urn).

Now we'll assemble this, but we won't need to record it. Instead, we'll just dump it to a lineprinter. Remember to call the first assembly thus: A/WE. This will stop assembly if there is an error. The final assembly call should be A/LP to get the printout. If you don't have a printer, simply leave the assembled code on the screen and proceed as follows.

From the printout, or screen display, read each byte of machine code and convert it to decimal. Remember that the four-digit bytes at the left are RAM addresses and each pair of bytes following them are single bytes of instruction which follow in sequence, twelve in all. These are the DATA bytes for statement 20. Statement 30, of course, writes them in memory, beginning at 28672, where we want them.

Now convert 28672 into LSB/MSB (least and most significant bytes). For those who may have forgotten, this is done by using the integer portion of 28672 divided by 256 as the MSB and then subtracting the product of MSB times 256 from 28672 to get LSB. Now you have what is needed for line 50.

Address 16526 is the location at which BASIC finds the starting address when USR tells it to run a machine language subroutine. If you have "Decipoke," which I presented October, 1982, in an article called "Decipoke — Taming the Wild X=USR(0)," it will do all the work and supply everything you need for the BASIC program. We're ready now to write the BASIC program. Just remember to protect memory address 28672 before you run it.

Enough of these LD and LDIR exercises! Next time, we'll look at some new Z-80 instructions. But, before we do, we're giving you a present. Figure 1 is a summary of all possible LD instructions the Z-80 is capable of executing. Here are some conventions used in this table (and in most literature on the Z-80): n is a single-byte number, nn is a two-byte number, (HL) is the contents of the address contained in HL, and (nn) is the contents of address nn.

Beginners often request a move between registers which the Z-80 can't make. They also often overlook possibilities which do exist. Hopefully, this table will help you avoid both of these.

Listing 2—Model I/III/4 Tape Systems*

```
10 '     LOADING MACHINE LA
NGUAGE PROGRAM
15 ' FOR DISK USE CHANGE L
INES 50 AND 80
16 ' AS FOLLOWS: 50 DEFUSR
0=28672
17 ' AND          80 X=USR0
(N)
20 DATA 205,127,10,17,0,60
,1,0,4,237,176,201
30 FOR RA=28672 TO 28683:R
EAD B:POKE RA,B:NEXT
40 '     STORING START ADDR
ESS FOR M/L PROGRAM
50 POKE 16526,0:POKE 16527
,112
60 '     ACTUAL BASIC PROGR
AM STARTS HERE:
70 CLS:INPUT "START RAM DU
MP WHERE";N
75 IF N>32767 THEN N=N-655
36
80 X=USR(N)
90 Z$=INKEY$:IF Z$="" THEN
 90
100 IF Z$="E" THEN CLS:STO
P
120 N=N+1024:GOTO 75
```

***For disk systems, change lines 50 and 80 to be:**
50 DEFUSR0=28672
80 X=USR0(N)

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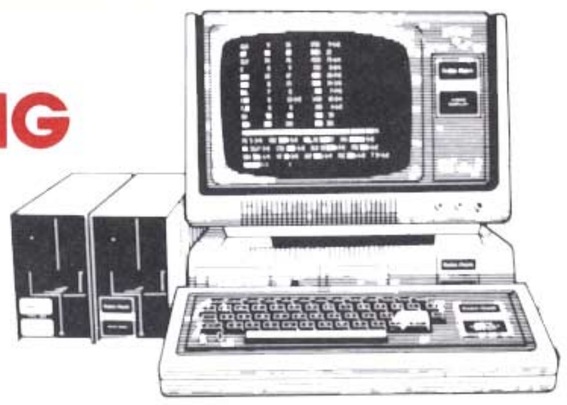
LD → With↓	SP	BC	DE	HL	Ix	Iy	A	B	C	D	E	H	L	R	(BC)	(DE)	(HL)	(Ix+)	(IY+)	(nn)	I
SP																				●	
BC																				●	
DE																				●	
HL	●																			●	
Ix	●																			●	
Iy	●																			●	
A								●	●	●	●	●	●	●	●	●	●	●	●	●	●
B							●		●	●	●	●	●				●	●	●		
C							●	●		●	●	●	●				●	●	●		
D							●	●	●		●	●	●				●	●	●		
E							●	●	●	●		●	●				●	●	●		
H							●	●	●	●	●		●				●	●	●		
L							●	●	●	●	●	●					●	●	●		
R							●														
(BC)							●														
(DE)							●														
(HL)							●	●	●	●	●	●	●								
(Ix+)							●	●	●	●	●	●	●								
(Iy+)							●	●	●	●	●	●	●								
(nn)	●	●	●	●	●	●	●														
I							●														
n							●	●	●	●	●	●	●				●	●	●		
nn	●	●	●	●	●	●															

Figure 1

DISK INTERFACING GUIDE for TRS-80 MODEL I



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Tandy topics

Updates on new software from Radio Shack

For all readers

Ed Juge, Director of Merchandising, Business Computer Products
1500 One Tandy Center, Ft. Worth, TX 76102

One problem I hope will be history by the time you read this deals with ribbons for Line Printers III and V. The trouble (ribbons jamming) began some months ago. As soon as reports started filtering in, our quality assurance team and the vendor went into action. Almost three months later, we haven't been able to pinpoint the problem. Of course, we are replacing ribbons without question unless they're simply "worn out." We placed emergency orders with another vendor, which should begin shipping to us by air this week. Unfortunately, any order takes a couple of months to ship.

The failure rate on the bad ribbons has been 7 to 8 percent. Our quality assurance normally rejects any shipment of any product at 3 percent defective, but we couldn't do it with a critical item like this and leave you without printer ribbons. At any rate, it should be solved long before you read this. I just thought you'd like to know that we don't sit on our hands in a situation like this.

Multi-user Scripsit and Profile

Any Model 16 owner will tell you that these are our two most requested (and latest) multi-user programs. For those who might be curious about the delays, here's an idea of what happened.

Profile is written for us by an outside source. It's a top-notch group, but like all of us, their resources are limited. We had to make a priority call for them between multi-user Profile, and the hard disk single-user version. We knew that if they tried to work both at the same time, *both* programs would be late. We felt the current user who's out of space is probably hurting worse than the one who needs to set up a new data base. So, we called HD Profile as the first priority. Multi-user Profile is now in-house and looks great! It includes all the Profile Plus utilities (forms, Prosort, lookup) and some additional features you're going to like, including conditional math, end-of-period processing, and transfer files to work processing or spreadsheet programs. Maximum capacities have been increased to 16 million records, 999 fields per record, and 4608 bytes per record. (Caveat — you're limited by disk space, so don't expect to equal all of these maximums in the same system.)

Multi-user Scripsit is also a program with increased capabilities. But, first, there are several things that need to be said about this program. We expect five to six users to be able to operate this package very well (using our new 3-user card). If you attempt to do word processing and other jobs concurrently on a Model 16, you must understand that "CPU-intensive" operations like Multiplan recalculation, compiling a program, loading a large program, general ledger updating, payroll calculation, etc., will cause significant delay in the screen response to the other users. In our testing, I saw document repaginations cause the screen to get three or four characters behind the typist (me). During a Multiplan recalculation, with three other active terminals, I was actually able to get more than a screen line ahead of the program. No characters were lost, but the effect on an average typist is disturbing.

What does this mean? Well, it doesn't mean we're slower than other similar products. I had our word processing experts look at some other multi-user word processing software running on 68000-based systems (some with faster clock speeds than the Model 16), and they found exactly the same thing. While you may not see this type of delay on a word processing-optimized and dedicated minicomputer, you probably will on a microcomputer. We actively looked for a system which ran faster, but we had no luck.

I think you'll find the features and capabilities of multi-user Scripsit to be outstanding! I believe our in-house design and programming team did a fantastic job. So, what does this mean to you about usability? Only that if most of your operators will be active all day, and you need to do word processing plus

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other jobs, you should consider a separate system for word processing. If your various jobs are active, but each is not running six or eight hours each day, tell your non-word processing operators to coordinate their CPU-intensive tasks with the word processing users. Keyboard entry into Multiplan, accounting packages, etc., doesn't slow up anything, but the updating processes will.

But, why are we so late? Well, developing multi-user Scripsit is comparable in complexity to writing an operating system. It took man-years! Then, when the coding was complete, we found the speed unacceptably slow. We spent several months debugging and optimizing the speed of the system. In short, to do it right just took a huge amount of time.

The bottom line is that as of this writing, we're telling the world to expect multi-user Profile and Scripsit by the end of December. If all goes really well, we might even make it by mid-to-late November.

Software Development

You know, I'm asked all of the time why we can't ever get a software package out "on time." After all, we produce complex hardware products in less time, even with 4- and 5-month parts lead-times. Those of you who are programmers certainly know that you can write a pretty good program in a week or so if you have the time to work on it. Surely a full-time professional programming team can write a program in a month, right? I'll bet even a few professional DP'ers are saying to themselves "That's the way we do it, plus parallel (with the old system) testing for a month or so."

In the cases of your personal program, or a DP shop's in-house program, if you hit a bug six months down the road, you just go in and fix it, and keep going. We don't have that luxury. We have to try our best (which often isn't good enough) to catch all the bugs before we first release the program. We have to try to anticipate all of the things a user may try to do with the program . . . all of the types of input and combinations of factors which might be encountered. The program has to be checked on all versions of the hardware. The documentation must be understandable to the computer novice. In short, there are a lot of bases to cover.

We normally have over 100 different programs in design, coding, testing or production at any given time, so there's a major scheduling and priority issue. We're committed this year to try to find, invent, or conjure up a method for developing better software in less time. It's going to be an all-out effort!

TRS-Xenix

I get letters raving about how *great* Xenix is. I've read at least one recognized Unix expert's opinion that the Model 16 was one of, if not the, best Xenix micro system around. But, I also get letters asking how we could sell such a terrible system! Wow . . . no middle ground at all. It tells me I'm hearing from two kinds of customer: the already-competent Unix programmer loves it; and the Unix beginner who, in trying to use the Xenix development system, is *way* over his/her head.

Our Xenix runtime system and applications software should give any user an easy-to-operate multi-user applications engine. And, I believe it does.

The TRS-Xenix development system is intended as a development tool for the trained Unix/Xenix programmer. Xenix, like Unix, is not a beginner's system, and the manuals are not tutorial. I haven't used either, but my experts tell me there are known quirks or bugs in both, which probably never will be fixed. Experienced users know all the "workarounds." So, the message is: Unless you're an experienced Unix/Xenix programmer, or you're willing to spend $750 as a learning experiment (and find your own teaching material), the TRS-Xenix development system may not be for you!

Model 100 Print Program

In my July column, I gave you a print output formatter I wrote for the Model 100. It also exists on CompuServe in public access, and in several SIGS (special interest groups). I was told *Byte* magazine published it recently, but haven't looked. Anyway, there was a bug in an early version which caused the first line of every page to left justify instead of observing your specified margins. The current program, as it exists in CompuServe's public access section, is correct. I suspect some SIGs picked up early (buggy) versions. Or, you should be able to cure your version by changing line 140 as follows:

```
140 IFHD$="Y" OR HD$="y"
THEN PR$=L$: GOSUB360
```

One more very common question that comes up about the Model 100 is why the NEC portable can handle more RAM. Very simply, they have no built-in modem, and the box is thicker, so they can physically fit the chips into the unit and dangle an external RAM pack out the side of the unit. What is not made clear by NEC is that you can only access one single 32K bank at a time, and files can't span banks. Say you had a spreadsheet program and data file in one bank and needed to create a second data file, but didn't have enough RAM. You'd have to buy another 32K bank, duplicate the program in it, then create your second data file in the same bank.

The effect is that of unplugging your entire random access memory and plugging in a different memory, but in reality you just switch between them. Now that's not all bad, but it's a very expensive alternative to cassette or CompuServe disk storage.

There are several other significant differences. They can't offer auto dial, auto logon (which allows automatic one-button EMAIL and Dow Jones quotes), our BCD match pack — the most accurate Microsoft has ever produced (theirs is standard floating point), accessibility of service, etc. A detailed comparison would be another story and I'm out of time and space.

We submitted the Model 100 for testing by Ford Aerospace Labs, and they have certified it as being in compliance with the regulations governing electronic devices for use on board airlines! By the time you read this, we hope to have "official sanction" from one or more airlines, for on-board use of the TRS-80 Model 100. See you next month!

Break-break

Getting the break key out of the way

Models I/III/4

John E. Wright, Corning, NY

A good deal has been said about the location of the break key on the Models I/III. The usual solution to this annoyance has been to disable the break with a poke 16396,23.

If you have ever tried this and then entered the auto command, you know what a disaster that can be. With no escape from the auto command now possible, you will lose everything that has been keyed in — a single line if

Listing 1 — Source Code for Break-break

```
FFC3            00100           ORG     0FFC3H          ;DECIMAL 65475 FOR 48K
FFC3 CDC901     00110 BEGIN     CALL    01C9H           ;CLEAR SCREEN
FFC6 2A1640     00120           LD      HL,(4016H)      ;GET KEY SCAN LOC'N
FFC9 22D4FF     00130           LD      (START+1),HL    ;PLACE AT START
FFCC 21D3FF     00140           LD      HL,START        ;GET START LOCATION
FFCF 221640     00150           LD      (4016H),HL      ;PUT IN KEY SCAN INTERRUPT
FFD2 C9         00160           RET
FFD3 CD0000     00170 START     CALL    $-$             ;KEY SCAN LOC'N IS HERE
FFD6 F5         00180           PUSH    AF              ;SAVE REGS
FFD7 21FBFF     00190           LD      HL,LASKY        ;LAST KEY LOC'N
FFDA FE01       00200           CP      1               ;WAS BREAK KEY PRESSED
FFDC 2804       00210           JR      Z,BREAK         ;IF YES -HOW MANY TIMES
FFDE 3016       00220           JR      NC,NOBK         ;BREAK NOT PRESSED
FFE0 F1         00230 FINNI     POP     AF              ;RESTORE REG
FFE1 C9         00240           RET                     ;RETURN TO  PROGRAM
FFE2 B7         00250 BREAK     OR      A               ;CLEAR FLAGS
FFE3 7E         00260           LD      A,(HL)          ;GET LAST KEY FROM STORE
FFE4 FE01       00270           CP      1               ;WAS IT A BREAK
FFE6 2807       00280           JR      Z,BK1           ;YES-GO COMPLETE BREAK
FFE8 3E01       00290           LD      A,1             ;NO-THEN GET A 1
FFEA 77         00300           LD      (HL),A          ;AND PLACE IN STORE
FFEB F1         00310           POP     AF              ;RESTORE REG
FFEC 3E2D       00320           LD      A,'-'           ;FIRST BREAK SO REPLACE
FFEE C9         00330           RET                     ;WITH A DASH AND RETURN
FFEF 3E00       00340 BK1       LD      A,0             ;GET A ZERO AND
FFF1 77         00350           LD      (HL),A          ;PLACE IN STORE
FFF2 F1         00360           POP     AF              ;RESTORE REGS
FFF3 3E01       00370           LD      A,1             ;ENTER BREAK AND
FFF5 C9         00380           RET                     ;RETURN TO BASIC
FFF6 3E00       00390 NOBK      LD      A,0             ;KEY OTHER THAN BREAK
FFF8 77         00400           LD      (HL),A          ;SO ZERO STORE
FFF9 F1         00410           POP     AF
FFFA C9         00420           RET                     ;AND RETURN FOR NEXT KEY
FFFB 00         00430 LASKY     DEFB    0               ;1=BREAK ALL ELSE=0
FFC3            00440           END     BEGIN
00000 TOTAL ERRORS
```


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you are lucky or possibly an entire 16K program.

Is it really necessary to completely disable the break key? Couldn't we just slow it down a bit?

With this short utility, that is what I have tried to accomplish. Keep the break key there when you need it, but out of the way so that it is no trouble if you accidentally hit it.

When this program is loaded and the break key is accidentally hit, it is assumed that the dash was intended, the break is ignored and a dash placed in the text.

If you really want a break, just tap the key twice. There you are. The break key is conveniently there when you need it and no longer an annoyance when you don't.

Power-up, set the memory size and load Break-Break. Now, set the AUTO command if you like and start typing. You will never have to worry again about accidentally hitting the break key.

Listing 2 is for Model I or Model III systems using 48K memory. If you are using a 16K system, make the changes in listing 3.

Listing 1, the assembly language version, is included only to show how the program was designed. To operate properly, it must be loaded and run from BASIC.

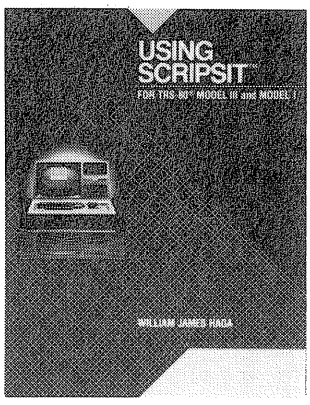
If you would like to save the object code and enter the program from the SYSTEM command, delete line 160 and enter a return to BASIC compatible with your system.

Listing 2 — Break-break for Disk BASIC

```
20 REM SET MEMORY SIZE 65474
30 DEFUSR=&HFFC3
40 FOR X=65475 TO 65531
50 READ I
60 POKE X+(X>32767)*65536,I
70 NEXT
80 DATA 205,201,1,42,22,64
90 DATA 34,212,255,33,211,255
100 DATA 34,22,64,201,205,0,0,245
110 DATA 33,251,255
120 DATA 254,1,40,4,48,22,241,201,183
130 DATA 126,254,1,40,7,62,1,119,241
140 DATA 62,45,201,62,0,119,241,62,1
150 DATA 201,62,0,119,241,201,0
160 X=USR(N)
170 NEW
```

Listing 3 — Break-break for Level II BASIC

```
10 REM MODEL I - MODEL III 16K BASIC
20 REM SET MEMORY SIZE 31699
30 POKE 16526,188:POKE 16527,127
40 FOR X=32700 TO 32756
90 DATA 34,205,127,33,204,127
110 DATA 33,244,127
```

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Yield 80

What is tax-free income worth to you?

Models I/II/III/4/12/16

George Kwascha, Durham, NC

One recurring question that exists among investors is "When are tax-free income yields equal to or greater than yields provided by taxable investments?" Yield-80 is a program that will assist the casual investor, as well as the professional, in answering such questions. Yield-80 will run with or without a printer.

The two formulas to compute tax-free yields versus taxable yields are shown below. These are incorporated into the program.

To compute tax-free yield when given the taxable yield, use the formula:

tax-free yield = taxable yield * (1 - federal tax bracket)

Example: If you are in a 35% federal income tax bracket and presently investing your money in a money market account yielding 8.0% and you are offered an opportunity to invest in a tax-free fund yielding 6.2%, which is the better investment? According to our formula:

tax-free yield = 8.0 * (1 - .35) = 5.2%

We can, therefore, conclude that the tax-free fund would be a better investment at 6.2% as compared to 5.2% after taxes for the taxable money market account.

To compute taxable yield when given the tax-free yield, use the formula:

taxable yield = tax-free yield / (1 - federal tax bracket)

Example: If you are in a 35% federal income tax bracket and are presently investing your money in a tax-free fund yielding 6.2%, what taxable yield would be equivalent to this amount? According to our formula:

taxable yield = 6.2 / (1 - .35) = 9.4%

The above calculation shows us that with a tax-free yield of 6.2% we are actually yielding the same as a taxable investment at 9.4%.

Operation and Features

Yield-80 is self-prompting with easy-to-understand instructions being displayed on the screen. Yield-80 will make the above calculations for you in one of three different methods:

1. Yield-80 will present you with the option of doing a quick calculation on the video screen for either taxable or tax-free yield. You enter your tax bracket and either the taxable or tax-free yield and Yield-80 will solve for the unknown value.

2. Yield-80 will allow you to print a table of yields. You are requested to input the known tax-free or taxable yield starting value and increment and starting value of the tax bracket and increment. You are also requested for the number of tax brackets you want printed.

3. Yield-80 will also allow you to generate a yield table on the video screen if you do not have a printer. The same values are required as described above, except the screen will only display nine tax brackets.

This program has been successfully used by a colleague of mine who is a stock broker. Please keep in mind that investments are a very complicated business and Yield-80 in no fashion is the ultimate answer in your decision-making process. Other factors besides percent yields must be taken into account when investing hard-earned cash. Do not hesitate to consult your broker.

Some states also allow tax exemptions for qualifying tax-free investments. To do such calculations, just add the exempted state tax rate to the federal tax rate when entering your tax bracket value.

Listing 1 — Models I/III/4

```
1 REM----------------------------------------
----------------------------
2 REM---          Program Name:  YIELD8Ø/B
AS version 2.Ø     ----------
3 REM---          Tax-Free vs Taxable Yiel
d Calculator       ----------
4 REM---            copyright 1983 by Geor
ge Kwascha         ----------
5 REM----------------------------------------
----------------------------
6 CLS:CLEAR9ØØØ:DEFINTG-N:DEFSTRQ:GOTO66
Ø
8 REM========================================
============================
9 REM================ String Input Sub
routine ================
1Ø Q=INKEY$:QN="":GL=Ø:PRINT@G,STRING$(F
L,136);STRING$(FL,24);
12 PRINTCHR$(14);:FORI=1TO25:Q=INKEY$:IF
Q<>""THEN13ELSENEXT:PRINTCHR$(15);:FORI=
1TO25:Q=INKEY$:IFQ<>""THEN13ELSENEXT:GOT
O12
13 PRINTCHR$(14);:IFFL=GLTHEN14ELSEIFQ>=
"."ANDQ<="9"ANDNOT(Q="/")THEN2Ø
```


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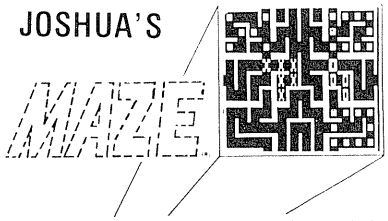
```
14 IFQ<>CHR$(8)THEN18ELSEIFGL=ØTHEN12ELS
EPRINTCHR$(24);
15 QN=LEFT$(QN,LEN(QN)-1)
16 GL=GL-1:POKE16418,136:GOTO12
18 IFQ<>CHR$(13)THEN12ELSEPRINTSTRING$(F
L-GL,32);
19 PRINTCHR$(15);:I=25:NEXT:RETURN
2Ø PRINTQ;:QN=QN+Q:GL=GL+1:GOTO12
21 REM==========================
==========
22 REM========== Miscellaneous Subr
outines ==========
1ØØ N=5:FORI=1TO13:N=N+64:PRINT@N,CHR$(1
49);:NEXT:PRINT@198,STRING$(53,131);:RET
URN
1Ø5 GT=PEEK(14312)AND24Ø:IFGT<>48PRINT@9
67,CHR$(31);"Line Printer not ready ...
hit ANYany key when ready";ELSERETURN
1Ø6 Q=INKEY$:IFQ=""THEN1Ø6ELSE1Ø5
11Ø V=9Ø9:PRINT@337,"Tax Bracket
%";:PRINT@4Ø1,"Taxable Yield %";
:PRINT@465,"Tax-Free Yield %";
:PRINT@576,"Instructions: Enter your Ta
x Bracket & either the Taxable Yieldor T
ax-Free Yield,whichever is available. Th
e field that";
12Ø PRINT" is leftblank will be calculat
ed and displayed on thescreen."
13Ø PRINT@V,"use <left arrow> to backspa
ce OR";:PRINT@V+7Ø,"<enter> to tab
to next field";:RETURN
135 PRINT@714,"Enter number of Tax Brack
ets to be printed:":RETURN
14Ø PRINT@522,"Enter increment for:":PRI
NT@593,"Tax Bracket":PRINT@657,"Yield":R
ETURN
15Ø G=354:FL=2:GOSUB1Ø:TB=VAL(QN):IFTB=Ø
THEN16ØELSEG=418:FL=5:GOSUB1Ø:TY=VAL(QN)
:G=482:FL=5:GOSUB1Ø:TF=VAL(QN):IFTY=TFTH
EN16ØELSEG=6Ø9:FL=3:GOSUB1Ø:TI=VAL(QN):I
FTI=ØTHEN16ØELSEG=673:FL=3:GOSUB1Ø:YI=VA
L(QN):IFYI=ØTHEN16ØELSERETURN
151 G=759:FL=2:GOSUB1Ø:P=VAL(QN):IFP=ØTH
ENP=1ØELSERETURN
152 RETURN
16Ø PRINT@V-56,CHR$(31);:PRINT@V+8,CHR$(
31);"Error in input !!!";:PRINT@V+7Ø,CHR
$(31);"hit <ENTER> to try again";
17Ø Q=INKEY$:IFQ=""THEN17ØELSEIFQ=CHR$(1
3)GOSUB13ØELSE17Ø
18Ø GOTO15Ø
2ØØ REM==========================
==========
```


Now . . . .

FOR THE TRS-80 MODEL I & III*

JOSHUA'S



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As Reviewed in
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Electronic Learning 6/83

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```
210 REM========================= Main Menu =
==========================
230 CLS:PRINT@77,CHR$(23);"== MAIN MENU
==":PRINT@194,"1. Quick Yield Calculatio
n":PRINT@258,"2. Table of Yields - Print
er":PRINT@322,"3. Table of Yields - Scre
en":V=840:PRINT@386,"4. End of Program":
GOSUB750
240 Q=INKEY$:IFQ=""THEN240
250 IFQ<CHR$(49)ORQ>CHR$(52)THEN240
260 I=VAL(Q):ONIGOTO290,370,520,630
270 REM=================================
==========================
280 REM================ Option 1. Quick Y
ield Calculation ================
290 CLS:PRINT@20," Quick Yield Calculati
on ":PRINT@64,STRING$(63,131);:GOSUB110
300 G=354:FL=2:GOSUB10:TB=VAL(QN):IFTB=0
THEN320ELSEG=418:FL=5:GOSUB10:TY=VAL(QN)
:G=482:FL=5:GOSUB10:TF=VAL(QN):IFTY=TFTH
EN320ELSEIFTY=0TY=TF/(1-(TB/100)):PRINT@
423,"= ";TY;"%";:PRINT@576,CHR$(31);:GOT
O330
310 IFTF=0THENTF=TY*(1-(TB/100)):PRINT@4
87,"= ";TF;"%";:PRINT@576,CHR$(31);:GOTO
330
320 PRINT@V-56,CHR$(31);"Error in input
!!!";
330 PRINT@V,CHR$(31);"hit <ENTER> to try
 again   OR";:PRINT@V+70,"<@>   to retur
n to main menu";
340 Q=INKEY$:IFQ=""THEN340ELSEIFQ=CHR$(1
3)THEN290ELSEIFQ=CHR$(64)THEN230ELSE340
350 REM=================================
==========================
360 REM================ Option 2. Table of
Yields - Printer ================
370 CLS:PRINT@19," Table of Yields - Pri
nter ":PRINT@64,STRING$(63,131);:PRINT@2
66,"Enter Starting Value for:":GOSUB110:
GOSUB140:GOSUB135:GOSUB150:GOSUB151:GOSU
B105
425 PRINT@V,CHR$(31);"          PPrinti
ng";:IFTY=0LPRINTTAB(15)"A Tax-Free Yiel
d of:"ELSELPRINTTAB(15)"A Taxable Yield
of:"
430 LPRINTTAB(13)CHR$(58);STRING$(54,45)
:LPRINTTAB(5)"Tax";TAB(13);CHR$(58);TAB(
15);
450 IFTF=0THENT1=TY:TY=TY-YI:FORI=1TO9:T
Y=TY+YI:LPRINTUSING"##.#%%";TY;"% ";:NEX
T:LPRINT:LPRINTTAB(5)"Bracket";TAB(13);C
HR$(58);TAB(14);STRING$(54,45):LPRINTTAB
(13)CHR$(58);TAB(15)"is equivalent to a
percent Tax-Free Yield of:"
460 IFTY=0THENT2=TF:TF=TF-YI:FORI=1TO9:T
F=TF+YI:LPRINTUSING"##.#%%";TF;"% ";:NEX
T:LPRINT:LPRINTTAB(5)"Bracket";TAB(13);C
HR$(58);TAB(14);STRING$(54,45):LPRINTTAB
(13)CHR$(58);TAB(15)"is equivalent to a
percent Taxable Yield of:"
465 LPRINTTAB(5)STRING$(8,45);CHR$(58);S
TRING$(54,45):T8=TY:T9=TF:TB=TB-TI:FORI=
1TOP:TB=TB+TI:LPRINTTAB(5)TB;" %";TAB(13
);CHR$(58);TAB(14);
470 IFT8=0THENTF=T2:FORJ=1TO9:TY=TF/(1-(
TB/100)):LPRINTUSING"###.##";TY;:TF=TF+Y
I:NEXTJ:LPRINT:NEXTI
480 IFT9=0THENTY=T1:FORJ=1TO9:TF=TY*(1-(
TB/100)):LPRINTUSING"###.##";TF;:TY=TY+Y
I:NEXTJ:LPRINT:NEXTI
490 PRINT@V,CHR$(31);"hit any key to ret
urn to menu";:Q=INKEY$:IFQ=""THEN490ELSE
230
500 REM=================================
==========================
510 REM================ Option 3. Table of
Yields - Screen ================
520 CLS:PRINT@19," Table of Yields - Scr
een ":PRINT@64,STRING$(63,131);:PRINT@26
6,"Enter Starting Value for:":GOSUB110:G
OSUB140:GOSUB150
530 CLS:IFTY=0PRINT@6,"Tax-Free Yield of
:";ELSEPRINT@6,"Taxable Yield of:";
540 GOSUB100:PRINT@64,"Tax";:PRINT@128,"
Brkt";:IFTY=0PRINT@134,"is equivalent to
 a % Taxable Yield of:";ELSEPRINT@134,"i
s equivalent to a % Tax-Free Yield of:";
550 IFTF=0THENT1=TY:TY=TY-YI:PRINT@70,CH
R$(15);:FORI=1TO9:TY=TY+YI:PRINTUSING"##
.#%%";TY;"% ";:NEXT
560 IFTY=0THENT2=TF:TF=TF-YI:PRINT@70,CH
R$(15);:FORI=1TO9:TF=TF+YI:PRINTUSING"##
.#%%";TF;"% ";:NEXT
570 N=256:T3=TB:TB=TB-TI:FORI=1TO10:TB=T
B+TI:PRINT@N,CHR$(15);:PRINTUSING"##%%";
TB;"% ";:N=N+64:NEXT
580 IFTY=0THENTF=T2:TB=T3:N=262:FORI=1TO
10:PRINT@N,CHR$(15);:FORJ=1TO9:TY=TF/(1-
(TB/100)):PRINTUSING"###.# ";TY;:TF=TF+Y
I:NEXTJ:N=N+64:TB=TB+TI:TF=T2:NEXTI
590 IFTF=0THENTY=T1:TB=T3:N=262:FORI=1TO
10:PRINT@N,CHR$(15);:FORJ=1TO9:TF=TY*(1-
(TB/100)):PRINTUSING"###.# ";TF;:TY=TY+Y
I:NEXTJ:N=N+64:TB=TB+TI:TY=T1:NEXTI:Q=IN
KEY$
600 PRINT@977,"hit any key to return to
menu";:Q=INKEY$:IFQ=""THEN600ELSE230
610 REM=================================
==========================
620 REM================          End of Pro
gram          ================
630 CLS:END
```

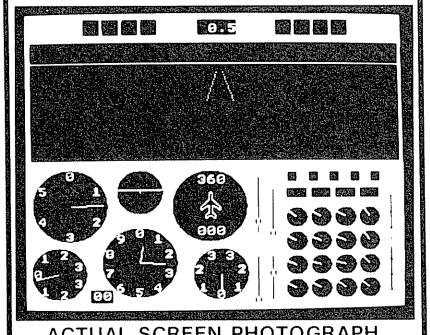

Refer to advertiser index for reader service number

```
640 REM==================================
==================================
650 REM=================== Title Screen
==================================
660 PRINT@15,CHR$(181);CHR$(128);CHR$(18
6);CHR$(128);CHR$(191);CHR$(128);CHR$(19
1);CHR$(131);CHR$(131);CHR$(128);CHR$(19
1);STRING$(3,128);CHR$(191);CHR$(131);CH
R$(189);STRING$(5,128);CHR$(190);CHR$(13
1);CHR$(189);CHR$(128);CHR$(190);CHR$(13
1);CHR$(189);
670 PRINT@79,CHR$(130);CHR$(191);CHR$(12
9);CHR$(128);CHR$(191);CHR$(128);CHR$(19
1);CHR$(131);CHR$(128);CHR$(128);CHR$(19
1);STRING$(3,128);CHR$(191);CHR$(128);CH
R$(191);CHR$(128);STRING$(3,131);CHR$(12
8);CHR$(190);CHR$(131);CHR$(189);CHR$(12
8);CHR$(191);
680 PRINT@107,CHR$(191):PRINT@144,CHR$(1
31);CHR$(128);CHR$(128);CHR$(131);CHR$(1
28);STRING$(3,131);CHR$(128);STRING$(3,1
31);CHR$(128);CHR$(131);CHR$(131);CHR$(1
29);STRING$(5,128);CHR$(130);CHR$(131);C
HR$(129);CHR$(128);CHR$(130);CHR$(131);C
HR$(129);
690 PRINT" version 2.0":PRINT@205,"Tax-F
ree vs Taxable Yield Calculator":PRINT@3
44,"copyright 1983":PRINT@408,"George Kw
ascha"
700 PRINT@512,"YIELD-80  will calculate
the equivalent tax-free yield needed toe
qual a taxable yield on an investment. Y
IELD-80 also calculatesthe taxable yield
 needed to equal a tax-free investment.
 Output";
710 PRINT"is in table form to video scre
en or printer. A quick calculationfeatur
e is also available for single yields.
720 PRINT@980,"hit <ENTER> to continue";
730 Q=INKEY$:IFQ=""THEN730
740 IFQ=CHR$(13)THEN230ELSE730
750 PRINT@V,"Choose one of the above":RE
TURN
760 REM==================================
==================================
```

Listing 2 — Models II/12/16

```
>LIST
1 REM -
2 REM---          Program Name:  YIELD80/B
AS version 2.0     ----------
3 REM---          Tax-Free vs Taxable Yiel
```


T.R.S. 80 C/C 32K DRAGON
Software from England
747 FLIGHT SIMULATOR



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```
d Calculator          ----------
4 REM---              copyright 1983 by Geor
ge Kwascha            ----------
5 ON ERROR GOTO 105
6 CLS:CLEAR9000:DEFINTG-N:DEFSTRQ:GOTO66
0
8 REM =
9 REM====== String Input Subroutine =
10 Q=INKEY$:QN="":GL=0:PRINT@G,STRING$(F
L,95);STRING$(FL,28);
12 PRINTCHR$(01);:FORI=1TO25:Q=INKEY$:IF
Q<>""THEN13ELSENEXT:PRINTCHR$(02);:FORI=
1TO25:Q=INKEY$:IFQ<>""THEN13ELSENEXT:GOT
O12
13 PRINTCHR$(01);:IFFL=GLTHEN14ELSEIFQ>=
"."ANDQ<="9"ANDNOT(Q="/")THEN20
14 IFQ<>CHR$(8)THEN18ELSEIFGL=0THEN12ELS
EPRINTCHR$(28);
15 QN=LEFT$(QN,LEN(QN)-1)
16 GL=GL-1:GOTO12
18 IFQ<>CHR$(13)THEN12ELSEPRINTSTRING$(F
L-GL,32);
19 PRINTCHR$(02);:I=25:NEXT:RETURN
20 PRINTQ;:QN=QN+Q:GL=GL+1:GOTO12
21 REM =
22 REM = Miscellaneous Subroutines =
100 N=6:FORI=1TO13:N=N+80:PRINT@N,CHR$(1
57);:NEXT:PRINT@247,STRING$(53,150);:RET
URN
105 IF ERR=56 THEN PRINT@1200,"PRINTER N
OT READY"
106 INPUT"Press ENTER to continue";A$
107 RESUME 425
110 V=1064:PRINT@337,"Tax Bracket
 %";:PRINT@417,"Taxable Yield          %"
;:PRINT@497,"Tax-Free Yield          %";
:PRINT@644,"Instructions:  Enter your Ta
x Bracket & either the Taxable Yield or
Tax-FreeYield,whichever is available. Th
e field that";
120 PRINT" is leftblank will be calculat
ed anddisplayed on thescreen."
130 PRINT@V,"use <left arrow> to backspa
ce   OR";:PRINT@V+87,"<enter>    to tab
to next field";:RETURN
135 PRINT@887,"Enter number of Tax Brack
ets to be printed:":RETURN
140 PRINT@644,CHR$(24):GOSUB130:PRINT@64
7,"Enter increment for:":PRINT@737,"Tax
Bracket":PRINT@817,"Yield":RETURN
150 G=354:FL=2:GOSUB10:TB=VAL(QN):IFTB=0
THEN160ELSEG=434:FL=5:GOSUB10:TY=VAL(QN)
:G=514:FL=5:GOSUB10:TF=VAL(QN):IFTY=TFTH
EN160ELSEG=754:FL=3:GOSUB10:TI=VAL(QN):I
FTI=0THEN160ELSEG=834:FL=3:GOSUB10:YI=VA
L(QN):IFYI=0THEN160ELSERETURN
151 G=931:FL=2:GOSUB10:P=VAL(QN):IFP=0TH
ENP=10ELSERETURN
152 RETURN
160 PRINT@V-56,CHR$(24);:PRINT@V+8,CHR$(
24);"Error in input !!!";:PRINT@V+70,CHR
$(24);"hit <ENTER> to try again";
170 Q=INKEY$:IFQ=""THEN170ELSEIFQ=CHR$(1
3)THENGOSUB130ELSE170
180 GOTO150
200 REM ==
210 REM = Main Menu =
230 CLS:PRINT@33,"== MAIN MENU ==":PRINT
@184,"1. Quick Yield Calculation":PRINT@
264,"2. Table of Yields - Printer":PRINT
@344,"3. Table of Yields - Screen":V=586
:PRINT@424,"4. End of Program":GOSUB750
240 Q=INKEY$:IFQ=""THEN240
250 IFQ<CHR$(49)ORQ>CHR$(52)THEN240
260 I=VAL(Q):ONIGOTO290,370,520,630
270 REM ==
280 REM=== Option 1. Quick Yield Calcula
tion =
290 CLS:PRINT@35," Quick Yield Calculati
on ":PRINT@80,STRING$(80,45);:GOSUB110
300 G=354:FL=2:GOSUB10:TB=VAL(QN):IFTB=0
THEN320ELSEG=434:FL=5:GOSUB10:TY=VAL(QN)
:G=514:FL=5:GOSUB10:TF=VAL(QN):IFTY=TFTH
EN320ELSEIFTY=0THENTY=TF/(1-(TB/100)):PR
INT@433,"= ";TY;"%";:PRINT@576,CHR$(24);
:GOTO330
310 IFTF=0THENTF=TY*(1-(TB/100)):PRINT@5
13,"= ";TF;"%";:PRINT@576,CHR$(24);:GOTO
330
320 PRINT@V-56,CHR$(24);"Error in input
!!!";
330 PRINT@V,CHR$(24);"hit <ENTER> to try
 again   OR";:PRINT@V+86,"<@>   to retur
n to main menu";
340 Q=INKEY$:IFQ=""THEN340ELSEIFQ=CHR$(1
3)THEN290ELSEIFQ=CHR$(64)THEN230ELSE340
350 REM =
360 REM=== Option 2. Table of Yields - P
rinter =
370 CLS:PRINT@19," Table of Yields - Pri
nter":PRINT@80,STRING$(79,45);:PRINT@247
,"Enter Starting Value for:":GOSUB110:GO
SUB140:GOSUB135:GOSUB150:GOSUB151
380 ON ERROR GOTO 105
425 PRINT@V,CHR$(24);"              Printin
g";:IFTY=0 THENLPRINTTAB(15)"A Tax-Free
Yield of:"ELSELPRINTTAB(15)"A Taxable Yi
eld of:"
430 LPRINTTAB(13)CHR$(58);STRING$(54,45)
:LPRINTTAB(5)"Tax";TAB(13);CHR$(58);TAB(
15);
450 IFTF=0THENTI=TY:TY=TY-YI:FORI=1TO9:T
Y=TY+YI:LPRINTUSING"##.#";TY;:LPRINT"% "
;:NEXT:LPRINT:LPRINTTAB(5)"Bracket";TAB(
```


Refer to advertiser index for reader service number

```
13);CHR$(58);TAB(14);STRING$(54,45):LPRI
NTTAB(13)CHR$(58);TAB(15)"is equivalent
to a percent Tax-Free Yield of:"
46Ø IFTY=ØTHENT2=TF:TF=TF-YI:FORI=1TO9:T
F=TF+YI:LPRINTUSING"##.#%%";TF;"% ";:NEX
T:LPRINT:LPRINTTAB(5)"Bracket";TAB(13);C
HR$(58);TAB(14);STRING$(54,45):LPRINTTAB
(13)CHR$(58);TAB(15)"is equivalent to a
percent Taxable Yield of:"
465 LPRINTTAB(5)STRING$(8,45);CHR$(58);S
TRING$(54,45):T8=TY:T9=TF:TB=TB-TI:FORI=
1TOP:TB=TB+TI:LPRINTTAB(5)TB;" %";TAB(13
);CHR$(58);TAB(14);
47Ø IFT8=ØTHENTF=T2:FORJ=1TO9:TY=TF/(1-(
TB/1ØØ)):LPRINTUSING"###.##";TY;:TF=TF+Y
I:NEXTJ:LPRINT:NEXTI
48Ø IFT9=ØTHENTY=T1:FORJ=1TO9:TF=TY*(1-(
TB/1ØØ)):LPRINTUSING"###.##";TF;:TY=TY+Y
I:NEXTJ:LPRINT:NEXTI
49Ø PRINT@V,CHR$(24);"hit any key to ret
urn to menu";:Q=INKEY$:IFQ=""THEN49ØELSE
23Ø
5ØØ REM =
51Ø REM= Option 3. Table of Yields - Scr
een =
52Ø CLS:PRINT@19," Table of Yields - Scr
een ":PRINT@8Ø,STRING$(79,45);:PRINT@247
,"Enter Starting Value for:":PRINTCHR$(2
4):GOSUB11Ø:GOSUB14Ø:GOSUB15Ø
53Ø CLS:IFTY=ØTHENPRINT@6,"Tax-Free Yiel
d of:";ELSEPRINT@6,"Taxable Yield of:";
54Ø GOSUB1ØØ:PRINT@82,"Tax";:PRINT@162,"
Brkt";:IFTY=ØTHENPRINT@167,"is equivalen
t to a % Taxable Yield of:";ELSEPRINT@16
7,"is equivalent to a % Tax-Free Yield o
f:";
55Ø IFTF=ØTHENT1=TY:TY=TY-YI:PRINT@87,CH
R$(Ø2);:FORI=1TO9:TY=TY+YI:PRINTUSING"##
.#";TY;:PRINT"% ";:NEXT
56Ø IFTY=ØTHENT2=TF:TF=TF-YI:PRINT@87,CH
R$(Ø2);:FORI=1TO9:TF=TF+YI:PRINTUSING"##
.#";TF;:PRINT"% ";:NEXT
57Ø N=322:T3=TB:TB=TB-TI:FORI=1TO1Ø:TB=T
B+TI:PRINT@N,CHR$(Ø2);:PRINTUSING"##";TB
;:PRINT"% ";:N=N+8Ø:NEXT
58Ø IFTY=ØTHENTF=T2:TB=T3:N=327:FORI=1TO
1Ø:PRINT@N,CHR$(Ø2);:FORJ=1TO9:TY=TF/(1-
(TB/1ØØ)):PRINTUSING"###.# ";TY;:TF=TF+Y
I:NEXTJ:N=N+8Ø:TB=TB+TI:TF=T2:NEXTI
59Ø IFTF=ØTHENTY=T1:TB=T3:N=327:FORI=1TO
1Ø:PRINT@N,CHR$(Ø2);:FORJ=1TO9:TF=TY*(1-
(TB/1ØØ)):PRINTUSING"###.# ";TF;:TY=TY+Y
I:NEXTJ:N=N+8Ø:TB=TB+TI:TY=T1:NEXTI:Q=IN
KEY$
595 IF I=2 THEN GOTO 38Ø
6ØØ PRINT@1299,"hit any key to return to
 menu";:Q=INKEY$:IFQ=""THEN6ØØELSE23Ø
61Ø REM =
62Ø REM = End of Program =
63Ø CLS:END
64Ø REM ==
65Ø REM = Title Screen =
66Ø PRINT@3Ø,"YIELD-8Ø";
69Ø PRINT" version 2.Ø":PRINT@183,"Tax-F
ree vs Taxable Yield Calculator":PRINT@3
52,"copyright 1983":PRINT@432,"George Kw
ascha"
7ØØ PRINT@64Ø,"YIELD-8Ø  will calculate
the equivalent tax-free yield needed to
equal a taxableyield on an investment.
  YIELD-8Ø also calculates the taxable y
ield needed to equal a tax-free investme
nt. Output ";
71Ø PRINT"is in table form to video scre
en or printer.A quick calculation featur
e is also available for single yields.
72Ø PRINT@1148,"hit <ENTER> to continue"
;
73Ø Q=INKEY$:IFQ=""THEN73Ø
74Ø IFQ=CHR$(13)THEN23ØELSE73Ø
75Ø PRINT@V,"Choose one of the above";:R
ETURN
76Ø REM =
```


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BASIC bits

An UNKILL utility

Models III/4

Thomas L. Quindry, Burke, VA

I must apologize! Due to the unique structure of the Model III TRSDOS directory, this month's column is directed to Model III, TRSDOS 1.3. One disk drive and at least 32K are required for the program I will present called UNKILL/BAS. Model I owners, don't give up on me yet. Some of the concepts given, especially in the first listing, can easily be applied to the Model I, but it is beyond the present knowledge I have of TRSDOS 2.3 to apply the full UNKILL utility for the Model I.

Before I describe UNKILL, I must caution you to experiment with a backup diskette before implementing any of this month's programs.

Looking through an article giving the commands available for the new Model 4, one command struck my fancy. It was a command called "unkill." This command gives one a second chance after he has killed a file. It allows full recovery, provided another file has not been saved after the kill (which overwrites any of the sectors previously allocated to the killed file or its specification in the directory).

Most disk operation systems (DOS's) for both the Model I and Model III kill a file by changing only one byte in the directory entry for the particular file. Thus, a skilled computerist could easily reconstruct the file if he mistakenly killed the file. Some DOS's even include a utility to unkill a file if this mistake occurs.

All versions of TRSDOS, on the other hand, wipe out all traces of the directory entry when a file is killed. To reconstruct the directory entry in this case requires even more skill. It requires searching through all sectors of the disk to find where the program is located and then reconstructing a directory entry including hashcoding and granule allocation reentry. This search is called, by some, "mucking through the disk."

In order for my unkill utility to work, a little preventative patch must be applied to all diskettes with TRSDOS 1.3 on them. With a two-drive system, the easiest way to apply the patch is to create an AUTO DO file on a diskette to be placed in drive zero and specify the patch to be applied to the diskette in drive 1. (See line 120 of Listing 1. The patch is within quotes.) Putting each disk into drive 1 and hitting the reset key will accomplish the task.

With a one-drive system, this simple procedure is not possible. Normally, the patch would have to be keyed in manually for each diskette. This could be quite tedious and could be the cause of some errors if the procedure is not mechanized in some way.

Listing 1 gives a BASIC program structure that can be used to apply patches to either a Model I or Model III. The patches listed are strictly for Model III TRSDOS 1.3. The first patch in Listing 1 is mandatory so that the procedure that I outline below will work. It keeps TRSDOS 1.3 from clearing user memory during a boot-up or return to DOS. Without this patch, memory would be cleared and you would have to reload the program in Listing 1 each time it was to be run. There is actually no useful reason to have this memory cleared automatically. It causes me more of a nuisance than anything else when I am experimenting with TRSDOS. You can still clear any user memory you prefer by TRSDOS command.

The second patch in Listing 1 is mandatory to make the UNKILL/BAS utility work. It keeps TRSDOS 1.3 from zeroing all of the directory entry. Only the first byte of the directory entry will be altered, as in other DOS's. In order for a directory entry to be valid, the first byte of the directory entry must have bit 4 turned on (set). If this bit is off (reset), the directory entry is ignored. Instead of having to zero the entire directory entry to kill a file, it is only necessary to reset bit 4 of this first byte. That is what the second patch does.

In order to use Listing 1 to apply the patches listed, the following procedure must be followed:

1. In BASIC, key in the program and save it to disk using TRSDOS 1.3.
2. Put the diskette to be modified in drive zero.
3. Run the program.
4. The first patch will now be applied and you will have been returned to DOS. Enter the command, BASIC *. This will return you to BASIC while recovering your patch program.
5. Run the program again using the command RUN 100. This will enter the second patch.
6. You will again be returned to DOS. Enter the command, BASIC * to recover your patch program.
7. Repeat steps 2 through 6 until you have successfully patched all of your TRSDOS 1.3 copies.

Now that TRSDOS has been modified, Listing 2 can be used to unkill a file that you have mistakenly killed. When using unkill, all entries made on the TRSDOS 1.3 directory, whether active or killed, will be listed.

When a killed file is listed, the program will pause and you will have the opportunity to restore the file using the unkill feature. If you decline to restore the file, you will be asked if you want to zero the entry. Zeroing the entry is a one-way street. It does exactly what the unmodified

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TRSDOS does when killing a file. Once you zero the entry, you will not be able to recover the file using this program. You get a second chance if you first respond with "yes" to zeroing the entry because of the finality of the decision.

The unkill utility uses many of the tips discussed in previous "BASIC bits" columns and some new ones. Line 60 of Listing 2 saves user memory for the machine language subroutines and the buffer needed when sectors are read or written to. Line 70 sets up the string locations in memory which will be read from the buffer. The subroutine starting on line 170 places two machine language routines into protected memory. The first routine is very similar to the routine used for hashcode computation which is part of TRSDOS for either the Model I or III. In a future column, I will explain the need for hash coding and other things about the TRSDOS directories.

Starting with line 100, each directory entry is read from the disk and a determination is made whether the file has been killed or not. The unkill subroutine starting on line 360 determines whether you wish to restore a file. If you do, three things must be reconstructed. The program first sets bit 4 of the first byte of the directory entry. Then the hash code is determined from the filename. This hash code must be entered in the proper location on the second sector of the directory track. The program computes the code and the location where it should be entered, and enters it.

Next, the sectors which occupy the file to be restored must be reserved from future use. Part of the directory entry tells which granules are used. The program deciphers this information and places the proper marks in the granule allocation table on the first sector of the directory track.

Next month, almost equal time will be given to Model I users. I'll give a routine using the reset button for the Model I without expansion interface.

Remember to send your requests for future column topics, questions and tips to me, care of *Basic Computing*, 3838 South Warner Street, Tacoma, WA 98409. Send a self-addressed stamped envelope and I'll try to give you a personal, handwritten reply as long as the answer is not too long and involved. Problems of general interest may be included in future columns.

Listing 1— Mandatory patches to enable UNKILL file utility

```
10 'Mandatory PATCH for UNKILL File Util
ity
20 'BY Thomas L. Quindry
30 'Basic Computing, BASIC bits, Decembe
r 1983
40 'Model III and TRSDOS 1.3, one disk d
rive and 32K required
50 CLS:PRINT"STOP CLEAR OF USER MEMORY"
60 INPUT"INSERT DISK IN DRIVE:0 AND PRES
S <ENTER>";A$
70 A$="PATCH *1 (ADD=4E5D,FIND=20,CHG=18
)"+CHR$(13)
80 CMD"I",A$
90 'Implement the following PATCH by the
 command, RUN 100.
100 CLS:PRINT"SINGLE BYTE KILL PATCH"
110 INPUT"INSERT DISK IN DRIVE:0 AND PRE
SS <ENTER>";A$
120 A$="PATCH *3 (ADD=4FAE,FIND=3600D554
,CHG=CBA61808)"+CHR$(13)
130 CMD"I",A$
```

Listing 2— Utility to UNKILL files in TRSDOS 1.3. Patches given in Listing 1 must have been applied.

```
10 'UNKILL File Utility
20 'BY Thomas L. Quindry
30 'Basic Computing, Basic Bits, Decembe
r 1983
40 'Model III and TRSDOS 1.3, one disk d
rive and 32K required
50 ' Initialize and set up USR routines
60 CLS:POKE&H40B1,&HBF:POKE &H40B2,&HBE:
CLEAR50:DIMA$(4),B$(4),C$,A(12),B(12):B%
=0:B=VARPTR(B%)
70 FORN=0TO4:A=VARPTR(A$(N)):POKEA,&H30:
POKEA+1,&H30*N:POKEA+2,&HBF:A=VARPTR(B$(
N)):POKEA,11:POKEA+1,&H30*N+5:POKEA+2,&H
BF:NEXT:A=VARPTR(C$):POKEA,11:POKEA+1,&H
D9:POKEA+2,&HBE
80 GOSUB170
90 'Read directory and search for killed
 files
100 FORN=3TO18:POKE&HBEF1,N:X=USR1(0)
110 FORM=0TO4:IFASC(B$(M))>65THENIFASC(B
$(M))<91THENGOSUB310  :IF(ASC(A$(M))ANDI
6)<>0THENPRINTELSEPRINT,"<===== UNKILL F
ILE? ";:GOSUB360
120 NEXT:NEXT
130 END
140 'Inkey routine
150 Y$=INKEY$:IFY$=""THEN150  ELSERETURN
160 'Hashcode computation USR2 routine
170 FORN=&HBEC0TO&HBED8:READA:POKEN,A:NE
XT
180 DEFUSR2=&HBEC0
190 DATA33,217,190,6,11,14,0,126,35,169
200 DATA7,79,16,249,121,183,32,1,60,38
210 DATA0,111,195,154,10
220 'Sector Read/Write USR1 routine
230 FORN=&HBEF0TO&HBEFC:READA:POKEN,A:NE
XT
240 DEFUSR1=&HBEF0
250 DATA17,3,17,1,0,0,33,0,191,205,117,7
0,201
260 RETURN
270 'Sector Write routine
280 POKE&HBEFA,0:X=USR1(0):POKE&HBEFA,11
```

```
7
290 RETURN
300 'Print Filename routine
310 A=INSTR(B$(M)," "):IF(A<10RA>8)THENA
=9
320 PRINTLEFT$(B$(M),A-1);
330 IFMID$(B$(M),9,1)<>" "THENPRINT"/"RI
GHT$(B$(M),3);
340 RETURN
350 'Unkill routine
360 GOSUB150  :IF(Y$="Y"ORY$="y")THENPRI
NT"YES":GOTO410
370 PRINT"NO":PRINTTAB(23)"ZERO ENTRY? "
;:GOSUB150
380 IF(Y$="Y"ORY$="y")THENPRINT"YES":GOT
O620
390 PRINT"NO":RETURN
400 'Restore Directory entry and repair
GAT and HIT Sectors
410 A%=VARPTR(A$(M)):POKEB,PEEK(A%+1):PO
KEB+1,PEEK(A%+2):POKEB%,PEEK(B%)+16:B%=B
%+22:GOSUB280
420 MID$(C$,1,11)=B$(M)
430 FORN1=0TO12:A(N1)=PEEK(B%+N1*2):B(N1
)=PEEK(B%+1+N1*2):NEXT
440 'HIT repair
450 POKE&HBEF1,2:X=USR1(0):X=USR2(0):POK
E&HBF00+(N-3)*5+M,X:GOSUB280
460 'GAT repair
470 POKE&HBEF1,1:X=USR1(0):FORN1=0TO12
480 IFB(N1)=255THENN1=12:GOTO570
490 G=0:IF(B(N1)AND32)<>0THENG=1
500 IF(B(N1)AND64)<>0THENG=G+2
510 IF(B(N1)AND128)<>0THENG=G+4
520 NG=B(N1)AND31
530 A=PEEK(&HBF00+A(N1)):NG=NG-1:IF(AAND
2[G)=0THENA=A+2[G:POKE&HBF00+A(N1),A' ==
=> [ IS UP ARROW <===
540 IFNG=0THENGOTO570
550 G=G+1:IFG=6THENG=0:A(N1)=A(N1)+1
560 GOTO530
570 GOSUB280
580 NEXT
590 POKE&HBEF1,N:X=USR1(0)
600 RETURN
610 'Zero entire entry
620 PRINT,"REALLY ZERO ENTRY? ";
630 GOSUB150  :IF(Y$<>"Y"ANDY$<>"y")THEN
PRINT"NO":RETURN
640 PRINT"YES":MID$(A$(M),1,48)=STRING$(
48,0)
650 GOSUB280  :RETURN
```

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Adventurer's Club is starting for all Radio Shack computer users. For those interested in playing or writing new adventures. New adventure listings exchanged through a monthly newsletter. For more information contact Maurice Dow, 84 Camberley Cres., Brampton, Ontario, Canada L6V 3L4 or phone (416) 451-9452.

CoCo User's Group has been formed in the Spokane, WA area. For information contact Northwest Computer Club, c/o Judy Gehman, E. 14012 Cataldo, Spokane, WA 99216.

TRS-80 User's Group is now meeting at the Community College of Allegheny County, PA. The club meets in room D-303, every second Sunday of the month, from Noon to 5:00 PM. Phone (412) 466-6437 for more information.

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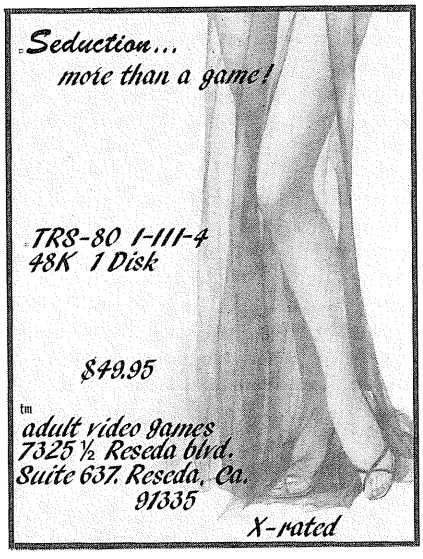

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Reviews

microMerlin
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MicroMerlin $1195

microMerlin is a 16-bit computer that may be attached to a TRS-80 Model I, III, 4 or LNW-80. When attached, you may run either regular Radio Shack-type software or 16-bit software, depending upon which operating system you have booted up. Micro Projects Engineering developed microMerlin as an intelligent peripheral. This device attaches to the TRS-80 via the expansion bus. It does not require opening up the computer. When microMerlin is attached, the TRS-80 keyboard, video and disk drives combine with the device to produce a 16-bit computer capable of running the same type of software that is available for the IBM PC computer.

The model I tested for this review was the Model III version with only the standard features. Setting up the microMerlin took about three minutes.

When the microMerlin is attached to your Radio Shack machine, the computer works in its normal manner until you decide to remove your TRSDOS-type operating system and replace it with one of the 16-bit operating systems supplied by Micro Projects Engineering. After inserting the new system disk and hitting reset, microMerlin comes to life. The TRS-80 now functions as an I/O and storage device for the "new" computer.

At the heart of microMerlin is an 8088 CPU, the same one used in several popular 16-bit computers. The CPU operates at 5.0 megaHertz. In its standard configuration microMerlin comes with 128 kilobytes of random access memory, a 4-kilobyte EPROM for system monitor, an RS-232C serial port and a Centronics-compatible printer port.

Additional hardware that may be added includes more memory (up to a total of 768 kilobytes), a color card that uses the TMS2918A and a 8087 numeric co-processor chip. Under development is a "ramdisk" configuration as well as provision for using the memory as a print spooler.

microMerlin does not have its own disk storage, but relies on the TRS-80 drives. To use the device with a TRS-80 Model I, at least one 40-track *double*-density drive is required. Currently, the Model I version supports both the Percom and the LNW 5/8 double-density boards. On the Model III, the drives and controller are double-density, so full compatibility is automatic.

Testing was performed using Digital Research's CP/M-86 operating system. In addition to the operating system, Micro Projects Engineering also supplied evaluation copies of Digital's new Personal BASIC and MicroPro's WordStar. The application software worked as it was supposed to. I was surprised at the WordStar implementation on microMerlin. With the large amount of memory, several pages of text could be held in memory at once, which made for very fast scrolling.

All the CP/M-86 utilities are supplied with the operating system, including a special version of DDT-86 that eliminates the need for an 80-character display.

Micro Projects is currently working on a version of Microsoft MS-DOS for use with this hardware. This is the same operating system supplied with the IBM PC.

Using this device with a Model I or III means that only a 16 by 64 display is available. Most of the software for use with 16-bit computers is designed with an 80-character by 24-line display in mind. A software utility, UCONS.CMD, is supplied that will re-route video to the microMerlin's RS-232C port. This allows you to connect an external terminal to the computer. If you choose to connect a terminal that supports an 80 by 24 display, you will have a display matching the application software that runs under the 16-bit operating systems. I tested this feature by connecting my Sanyo MBC-1000 computer to microMerlin, and operated the Sanyo in a terminal mode. An inexpensive terminal such as Radio Shack's DT-1 would work well with this device.

The microMerlin is not inexpensive, at $995 for a basic unit. However, the price is much lower than any other true 16-bit computer. Even when the price of an outboard terminal is added to the cost, the total price is still far less than a standard 16-bit computer.

microMerlin is not without a fault or two. The software does work as it is supposed to. Disks are interchangeable with the IBM PC. Most major 16-bit software does work with the device. Micro Projects Engineering does have some interesting new features that make microMerlin interesting: additional memory up to 768 kilobytes, a color graphics card, 8087 numeric co-processor, and more software on the way. The major drawback is very slow disk I/O with the system. The time required for loading programs is much slower than the standard TRS-80 disk I/O. *(Improvements have been made on the disk I/O to the newer models and the speed is now faster than the TRS-80 drives. —Ed.)* Documentation is adequate for an experienced user, but could use some additional "hand holding" for beginners.

microMerlin is an excellent means for the TRS-80 user to gain access to the 16-bit world. It does not interfere with normal operation of the Radio Shack computer, nor does it require any hardware modifications. The hardware is well thought out, well laid out, and cool running. I did not experience any problems with the system during the three weeks I had it for review.

Price list (partial): microMerlin with 128K, CP/M-86 $995; extra memory $275 (first 64K above 128), $189 (each additional 64K); color graphics $289, MS-DOS (to be available soon).

Harry Avant

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Prosoft is a small software firm with big ambitions. They produce Newscript, a very popular word processor, and several useful utilities for the Models I/III. Tallymaster is the latest in their arsenal of software. The program evolved out of a specific business need that Prosoft had. They needed an easy way to categorize, total and display their business expenses. After trying several approaches, including VisiCalc, owner Chuck Tesler decided to write an entirely new type of "electronic spreadsheet."

The original concept was to have a program that would simulate "a table full of clearly-labeled adding machines." This was accomplished by formulating a simple worksheet with 26 categories, labeled A-Z. Each category could be given a name such as "Blank diskettes," "Postage," etc. Each category could be added to (or subtracted from) by simply typing the letter corresponding to the category and an amount. The program would then display the new category total and the grand total of all categories on the page. Tallymaster can display and hold in memory up to 27 separate screens of 26 categories for a total of 702 labeled categories. In addition, each of the 27 screens can be considered a subcategory with a subtotal that can be transferred to a single worksheet in order to see all the subtotals at once. Totaling can be done by columns or rows.

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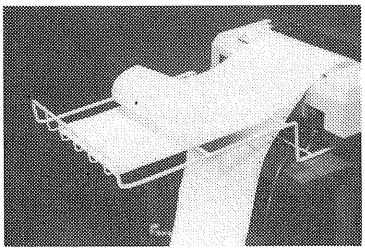

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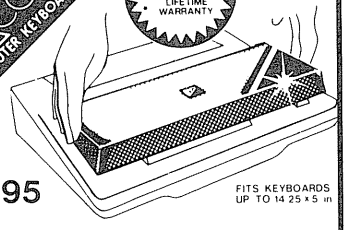

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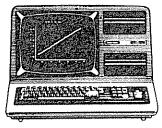

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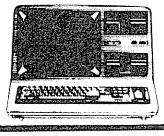

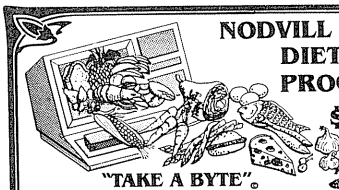

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as the program was compiled by the super-quick ZBASIC compiler from Simutek. The data can be sorted in four different sequences; the default is by category, or alphabetically by name, ascending by value, or descending by value. The sort is selective in that only a range of worksheets may be selected for sorting. This is one of the handiest features of the program. The worst case sort time is about two minutes when all 702 categories are in use and included in the sort. Most sorts take only a couple of seconds and on longer sorts, the program displays the estimated sort time.

The program is menu-driven and includes a handy on-line "help" command of all operating instructions. Numerals can be formatted in dollars and cents, as integers, or as percentages of the overall total. This is very useful in selecting areas to concentrate your efforts in improving things. Worksheets are stored and retrieved to, and from, diskette in a manner similar to VisiCalc. Unlike VisiCalc, worksheets can also be combined in one of two ways: adding the corresponding categories together, or placing them side-by-side. This is terrific for doing monthly or yearly totals on separate worksheets involving the same categories.

Several mathematical functions are provided in order to manipulate the data for projections. A range of data may be added, subtracted, multiplied, or divided. A range can also be multiplied, or divided, by a constant entered from the keyboard. A replicate command easily copies category names so that they do not have to be reentered. Another useful feature is a relocation command that will relocate a range of categories for you. In addition to all this, a disk directory can be displayed without interfering with work in progress. A range of values can be zeroed, a range of names and values can be cleared, or you may exit to DOS after a reminder prompt to save your worksheet to disk.

The report generator prints selected information with report titles, column headings and totals. It automatically produces multi-column, multi-page reports, or single-column reports with horizontal bar graphs to the right of the numbers for added utility. Parallel printers are supported, but serial drivers must be user-supplied or included in the DOS. The report generator is flexible and easy to use, and it produces excellent results.

Several tutorials are included on the disk and in the manual. There is even a home budget analysis file included on the disk for household budgeting. This is one of the most practical, useful home budgeting tools around. The documentation is first-rate — 98 pages contained in a padded binder, with clear examples and actual screen displays. We have come to expect first-class software from Prosoft, and they have delivered with Tallymaster. If you need to keep closer tabs on your home or business expenses, Tallymaster will enable you to do so with a minimum of effort. Highly recommended.

Jim Klaproth

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If you don't buy another thing for your Color Computer, buy Nanos Systems Corp.'s System Reference Card for Color and Extended Color BASIC. At $4.95, this is the best single investment anyone who is planning to run more than preprogrammed, commercial software on his machine can make. In other words, if you plan to program, plan to buy this card.

It's not really a card. Well, it is, but it doesn't look like one. It's a large piece of heavy paper folded into sixteen 3¾" x 8½" pages. Each page is full of information.

Text-mode graphics characters are presented in color on page one. Each color grouping has what is called a "magic number." The "magic number" is that number from which a graphic code must be subtracted to arrive at the code for the graphic that is the photographic negative of the one you started with. The "magic number" is different for each color group.

Pages two through seven are almost entirely devoted to the BASIC and Extended BASIC statements. The statements are grouped by category and each category is listed together in a box. A statement is preceded by a star if it is an Extended BASIC command. All options are presented and necessary examples are provided. Complex statements such as PRINT USING and DRAW rate their own boxes and detailed presentations. These pages also have boxes on special characters, logical and Boolean operators, special keys, error messages and derived functions including inverse, hyperbolic and inverse hyperbolic.

One page is devoted to music. All notes that can be duplicated by the Color Computer are shown on the musical staff. Below each note are its equivalent values for the PLAY and SOUND statements. The musical notation for pauses and note length are also given along with the corresponding pause and note length values for the PLAY statement.

The Nanos System Reference Card contains probably the best memory map for the Color Computer that I have seen. There are several programming tips including how to speed up the CPU, how to get the effect of a PCLEAR 0 and how to get more than two colors when in PMODE 4.

Not only is Nanos Systems Corp.'s TRS-80 Color BASIC and Extended System Reference Card an excellent quick reference guide for what you already know, you are certain to pick up something new as you look through it. No other book presents the vast store of information presented here as clearly and succinctly. Every Color Computer owner should own one.

Stephen G. Stone, III

VisiCalc™ for the TRS-80 Model I and Model III Computers
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The above two guidebooks are the latest in a series of guidebooks to aid you in the use of VisiCalc. Although the volumes are published as separate volumes, they appear to be identical with each containing a small section that describes the features that are unique to the different computers.

I found that the volumes are quite complete in their treatment of the use of VisiCalc features. There are detailed explanations of each of the commands and in the case of the Model I/III guidebook, there is an appendix which explains the differences between the VisiCalc versions which run on the two computers. There is, however, a serious error in the Operation section of the Model III handbook. The description of the disk write-protect feature is backward! Instead of saying that the existence of the foil tab write-protects the disk, the manual says the disk is "write-enabled." I hope that this will be corrected in future editions.

The volumes include a long chapter which describes several helpful case studies such as sales projections, interest computations, and portfolio evaluations. For an additional $39.95, you can purchase an optional data diskette for either the Model III or II/16 (dual disk machine is required) which includes most of the examples in the text and all of the case studies. There is also a short

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chapter which describes the situations in which VisiCalc should be avoided.

I give the volumes a qualified recommendation. If you have an early version of VisiCalc, the volumes will be helpful. If you are using the Model III enhanced version (catalog number 26-1569), look carefully at this product before you purchase it. The Radio Shack manual is better laid out and its graphics make the text easier to follow, although it does not have the case studies.

Timothy K. Bowman, CPA

Super Utility Plus 3.2
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Kim Watt has to be a genius. First he wrote Super Utility, the greatest disk utility ever invented for the Model I/III. He improved it by adding double-density support and many other features and called it Super Utility Plus. We reviewed one of the early versions of Super Utility Plus (version 2.0c) in October, 1982. New revisions kept issuing forth until, finally, version 2.2z was released. Kim's latest effort, version 3.2, is not a rehash of previous revisions, but is a total rewrite and re-assembly. Even the documentation has been completely redone. Since the earlier versions have been reviewed extensively and are well known, we will confine our comments to the new features of 3.0.

The first change is that the package now arrives in an attractive 3-ring binder. The manual consists of 160 pages of solid information. It is a great improvement over earlier attempts. Not only does it explain the features of the software, but it offers a full explanation of all messages that one may encounter, a list of common questions answered, a section on diskette structure, and some TRSDOS 1.3 patches. Instead of only one diskette, there are now two residing in the inside front cover. This offers the user an on-hand backup copy in case the working disk fails. This is a much better solution than having to send money for an extra backup copy. The disks are fully protected and cannot be copied by any normal means. In the event that either copy of the disk becomes unusable, the registered owner may send the disk in for replacement, for which a reasonable fee will be assessed.

Version 3.2 is completely memory-resident. This means that once it is loaded, the disk can be removed. The configuration method is much easier and now supports all major operating systems. Hard configuring is no longer necessary. Default settings (called DOS specifiers) are provided in the manual for TRSDOS, LDOS, DOSPLUS, MULTIDOS, and NEWDOS/80 version 2. Double-density support has been expanded to include relative sectoring, as required by NEWDOS/80 version 2. The lack of this feature was a major obstacle for NEWDOS/80 users who tried to use SU+ in the past. Most operating systems place the directory starting at track 17, sector 0, where SU+ expects to find it. NEWDOS/80 double-density diskettes have the directory starting at relative sector 170, which is in the middle of track 9. The only way in the past to have compatibility was to format the diskettes with the directory placed where SU+ wants to see it. The new version eliminates all this hassle, but works only with standard PDRIVE configurations.

New features also include automatic density recognition (a welcome feature, long overdue on all operating systems), automatic double-density adapter recognition (it can actually tell if a double-density adapter is installed in the machine and what kind it is), limited automatic DOS recognition, and automatic machine-type (I/III) recognition. The disk will boot up in a 35-, 40-, or 80-track drive and double-sided support is provided for LDOS, DOSPLUS, and MULTIDOS. About the only thing it won't work with is a double-sided NEWDOS/80 disk. It even supports the TRSDOS 2.7DD double-density system on the Model I. With this much flexibility, it should appeal to all disk users, except those who use hard disks exclusively.

If you already own Super Utility Plus and are happy with it, you probably don't need this new revision. The utilities appear to be identical to earlier releases, except that the special backup routine appears to be enhanced to cover some of the newer protection schemes. The main difference is in the improved flexibility and greater disk compatibility. If you have never purchased Super Utility Plus, hoping for an improved version, this is it! It would be difficult to find anything that this terrific utility program lacked. If you have an older SU+ and are using NEWDOS/80 with double-density disks, pick up this new version.

Jim Klaproth

Whirlybird Run
Color Computer
Spectral Associates
3420 S. 90th
Tacoma, WA 98409
(206) 581-6938
$21.95 tape, $25.95 disk

Whirlybird Run is a high-resolution graphics arcade game similar to Scramble or Super Cobra. In this game, you must guide your Whirlybird over some treacherous enemy territory, armed with bombs and super laser-cannons. You must clear a path for yourself, but this is not easy. The enemy also has some pretty powerful weapons, including rockets and fireballs. They also have advanced UFO's out there to stop you. It's rough, but you have just got to find and destroy their main reactor (their only source of power). It is a lonely job, but exciting. Besides, someone's got to do it -- it might as well be you.

The joystick controls movement, and speed, while the fire button fires lasers and drops bombs. Although it is well written and fun to play, I never really liked the arcade game it resembles. The graphics are outstanding, but the sound is only fair.

It must have taken quite a bit of skill to fit this game into 16K. It has all the five different scenarios: the hills, saucers, fireballs, cave and reactor.

This game is fun to play if you were a Scramble fan. Overall, I would say it was worth the money and, although I prefer better sound effects, this program could make someone happy.

Whirlybird Run requires quick reactions for maneuvering between fireballs, and a steady hand helps for maneuvering through tight places without wobbling or crashing. You do not need a particularly strong finger for firing, as you can simply hold down the button for continuous fire. This helps to clear your mind for the extensive joystick handling you will need to do. Efficient joystick handling is everything in this game.

Whirlybird Run takes some planning. You must work out your strategies for yourself. No two people can play the same way. For me, I take it low and fast over the hills, being careful to bomb everything. On the saucer part, I get just above the mountains and move back and forth, constantly shooting. If there is a lot of fuel at the bottom, I dive for it.

When the fireballs appear, I stay toward the top of the screen and keep dropping bombs. I am always making sure to dodge the fireballs, as in earlier experiences I have been known to watch my bombs go down the screen, hoping they make contact with a fuel container.

Through the cave, you must make some sharp turns, so I try to keep as far forward as possible so I can quickly move up or down without being forced forward. I constantly fire, as fuel is a must from here on.

The reactor maze is difficult to get through, but can be mastered. This is simply a matter of learning when to pull up or down. After the reactor, the game repeats.

Steve Skrzyniarz

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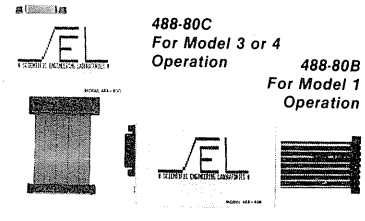

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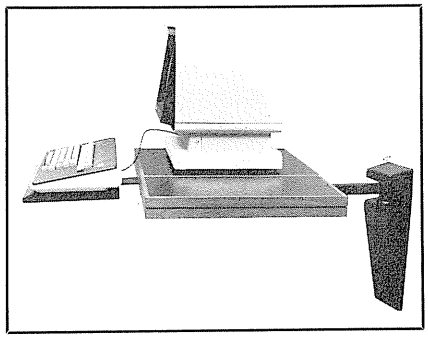
TableTech™ from Tumac Industries, Inc., has three easy-to-install components that provide sturdy and efficient use with CRT displays, printers, copy machines, forms processing, and other work station equipment. The adjustable table uses a wall-mounted pivot arm and rotating table surface for maximum space efficiency. A selection of components such as extensions, security devices, and a variety of surface sizes assure compatibility with every office environment. TableTech™ components are sold separately, starting at $59.95. Contact Tumac Industries, Inc., 650 Ford Street, Colorado Springs, CO 80915-3798 or call (303) 596-4400.

Wall-mounted workstation



Softcon

Softcon, an international conference and trade fair for software developers, marketers, distributors, retailer's, OEMs, and others, will be held February 21 through 23 at the Superdome in New Orleans, LA. It is the third largest annual trade show in the computer industry, surpassed in size only by the National Computer Conference and Comdex. The conference will feature over 60 seminars, discussions, and workshops. For information about exhibiting or attending Softcon, call or write Northeast Expositions, Inc., 822 Boylston Street, Chestnut Hill, MA 02167 (800) 841-7000. In Massachusetts call (617) 739-2000.

68K-BASIC

Trisoft now offers 68K-BASIC, a P-code type compiler and run-time library for the TRS-80 Model 16. Its use requires the CP/M 68K operating system which is also available from Trisoft. 68K-BASIC gives access to the full 68000 memory (up to 1 megabyte on a Model 16b) and has enhanced floating point accuracy that allows for advanced business and scientific applications. The ISAM file capability gives microcomputer users file and record handling capability usually found only on mainframes. The package is available from Trisoft for $299, including manual and shipping. The

manual is available for $25 for those wishing to study the package before purchasing. Contact Trisoft, 4102 Avenue G, Austin, TX 78751 (800) 531-5170. In Texas call (512) 453-2233.

Model 100 Businesspak+

Businesspak+ contains six programs for the manager or executive. Write+ turns the Model 100 into a complete word processor. Expns+ gives eighteen-column spreadsheets for daily expense or budget reports. Graph+ prints out bar, line, and pie charts of any Expns+ report on a DMP-100, as well as other, dot matrix printers. Telex+ allows for easy sending of any text file to any Telex number. Put+ is an information retrieval program and Sort+ allows any PUT+ file to be sorted alphabetically and numerically from any category in the entry. Contact Portable Computer Support Group, 11035 Harry Hines Blvd., No. 207, Dallas, TX 75229 (214) 351-0564.

Finger Print for Epson Printers

The Finger Print is available for the Epson MX-80, MX-100, FX-80, FX-100, and RX-80 printers. It gives easy access to such print functions as compressed, italic, or emphasized print modes. It also lets you select double-strike, perforation skip-over, left margin indent, 8 lines/inch, fine print and buffer clearing. Finger Print allows for manual changes in the printer configuration and eliminates the need to send, or remember, specialized control codes. It installs easily, is warranted for one year, and sells for $59.95. Contact Dresselhaus Computer Products, 837 E. Alosta Ave., Glendora, CA 91740 (213) 914-5831.

Supercord

Supercord overcomes a major obstacle in the purchase of either a personal computer or typewriter. It allows the connection of almost any computer to any electronic typewriter. A 4K memory buffer version is also available. Contact Cord, Ltd., 1548 Brookhollow Dr., Santa Ana, CA 92705 (714) 545-1643.

Market Master

The Market Master programs give the average investor the kind of research power necessary to test trading systems. Commodity and stock market trading schemes can be tested and refined in just minutes. Market Master can then provide buy and sell recommendations on a daily basis. Features include full hard copy modes including graphs of prices and trading indicators. The package requires 48K, 1 disk drive and an 80-column dot matrix or letter quality printer. Contact Management Services, 2901 Clendenen Lane, Longview, TX 75601 (214) 753-1850.

Profile III+ Add-ons

Four add-on products are now available for TRS-80 Model III Profile III+ users. Profile Forms prepares invoices, affidavits or any other form that requires more than two lines of data per record. Forms sells for $125. Transfer allows data to be relayed from one Radio Shack computer to another, via modem or RS-232 cables. The Transfer program for computers with the same diskette size sells for $150 and $200 for 5-1/4 and 8-inch transfers. Archive is a utility that will free diskette storage space by removing inactive records and transfer them to a pre-defined list or file. Archive sells for $150. Prosort, which also sells for $150, selects records by up to 16 criteria and sorts records by up to five criteria. Contact The Small Computer Company, Inc., 230 West 41st St., Suite 1200, New York, NY 10036 (212) 398-9290. Credit card order line is (800) 847-4740.

PortaCalc

PortaCalc is an electronic spreadsheet program for the Model 100. It features a 14 column by 26 row workspace and uses the built-in function keys to save, load, screen print, report print, or look at formulas in use. Worksheets may be saved, loaded, or merged using the computer's memory or cassette. PortaPrint is an included utility that allows left, right, and top margin settings as well as page length, page numbers, centered lines, and flush right justification. PortaDex is also included and it is a data exchange program that reformats PortaCalc files into the DIF format used by VisiCalc. The program requires 24K RAM. Contact Skyline Marketing, 4510 W. Irving Park Rd., Chicago, IL 60641 (312) 286-0762.

Logic Analyzer

OmniLogic, Inc., has introduced a full-function 16-channel logic analyzer add-on for the Models I,III, and 4 48K disk computers. It will provide both state and timing analysis up to 20 MHz. The model LA-1680 logic analyzer can collect 1000 data samples on each of 16 channels. Triggering modes include AND/OR/NOT as well as absence of repetitive event, repeat until correlated, and delay by event or time. Data may be stored, displayed, graphed and printed. The LA-1680 is priced at $1250. Contact OmniLogic, Inc., P.O. Box 87, Renton, WA 98057 (800) 228-OMNI. In Washington state call (206) 271-2000.

Model I Upgrade

The Norcom TC-III from Northern Technology is a replacement logic board for the Model I. It allows full upgrade to Model III performance while retaining the original keyboard and housing. The board includes a dual density floppy disk controller, 48K RAM, parallel printer port, reverse video character set, audio driver for a speaker, and dual speed cassette I/O. The user-installable board has a 90-day guarantee and sells for $399. An RS-232 board option sells for $50. Contact Northern Technology Corp., 2350 Brickvale Dr., Elk Grove, IL 60007 (312) 860-1772.

Coins

Compu-Quote offers a computerized inventory system for coin collectors. The program, Coins, is for 48K 2-disk Models I, III, or 4. The program includes information and market prices on 1500 of the most common U.S. coins in all grades. The information is updated and distributed on a quarterly basis to users. Non-standard coins may also be listed and maintained by the user. The program sells for $95 and quarterly updates are available for $25 each. Contact Compu-Quote, 6914 Berquist Ave., Canoga Park, CA 91307 (213) 348-3662.

Microsentry

Microsentry is designed to reduce dial-up security risks by shielding the microcomputer modem from un-

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authorized access. Users store caller access codes into Microsentry's memory. When activated, Microsentry's synthesized voice greets each caller with a request for his or her access code. Callers may enter their codes by touchtone button or voice. Authorized users will receive the modem tone. Random or unauthorized users remain unaware that they have reached a computer. The device also features call-screening in which calls may be diverted from the modem to any extension phone. Contact International Mobile Machines Corporation, IMM, 100 N. 20th Street, Philadelphia, PA 19103 (800) 523-0103, Ext. 510. In Philadelphia call (215) 569-1300, Ext. 510.

Multi-User Accounting

The RM/COS operating system allows a true multi-user environment for the Model 16. Up to three terminals can execute order entry, accounts receivable, accounts payable, general ledger, sales analysis, payroll, or inventory control. Terminal users can be accessing the same programs simultaneously. RM/COS requires 256K of RAM for three users, and 63K more RAM for each additional terminal. The operating system sells for $750 and specific application programs sell for $399 to $799 each. A utility to translate existing TRSDOS or Xenix accounting data files to RS/COS is also available. Contact Ball Technical Services, 211 North 1st St., Mt. Vernon, WA 98273 (206) 336-9525.

Plato's Cave

Plato's Cave forces players to operate within the confines of limited information-gathering ability. It is a dynamic and enthralling introduction to the relationship between evidence and inference and is suitable for children as young as eight. Players actively probe for data and synthesize and revise hypotheses as the data is acquired. At the highest difficulty level, even the most skilled scientists will be challenged. This Model III/4 game is one of many new offerings in educational computing from Krell Software Corporation, 1320 Stony Brook Road, Stony Brook, NY 11790 (516) 751-5139.

Instrument Rental

Nearly 1,000 electronic instruments are immediately available for rent from Genstar Rental Electronics, Inc. Amplifiers, analyzers, calibrators, counters, computers, PROM programmers, plotters and recorders are just a small sample of what is available. Items from over four dozen major manufacturers are available for rent from 30 days to three years. For a free catalog contact Genstar Rental Electronics, Inc., 6307 De Soto Ave., Suite J,

Memory Correct III typewriter

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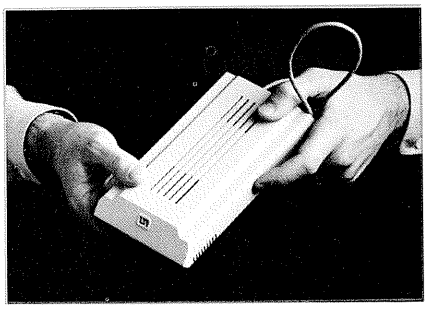

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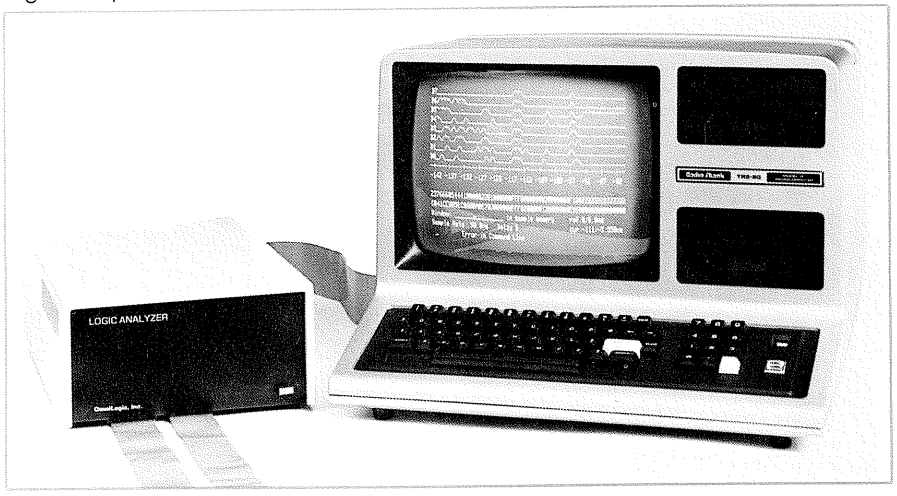
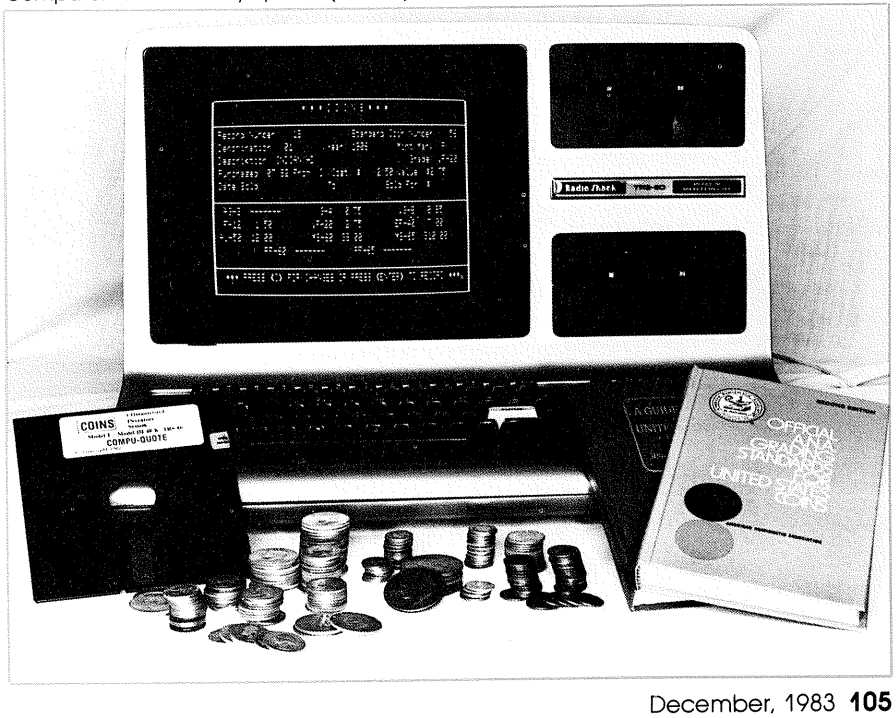


Computerized inventory system (COINS)



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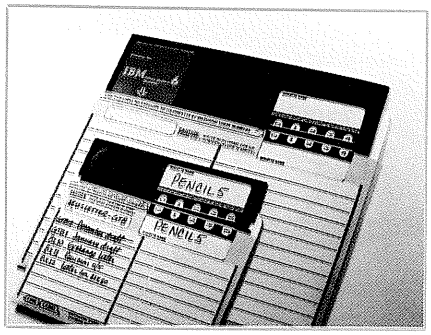
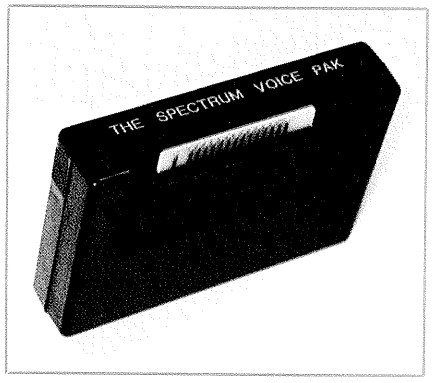


Voice Pak synthesizer



Model 100 Businesspak+

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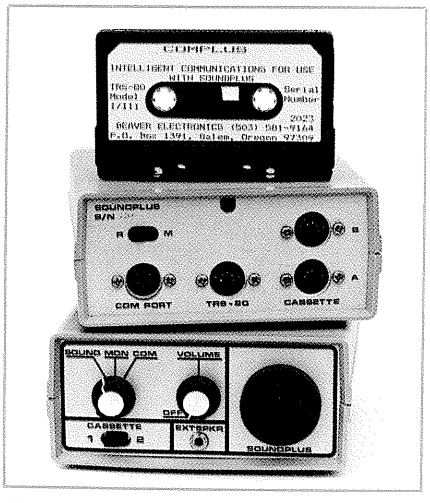


Woodland Hills, CA 91367 (213) 887-4000.

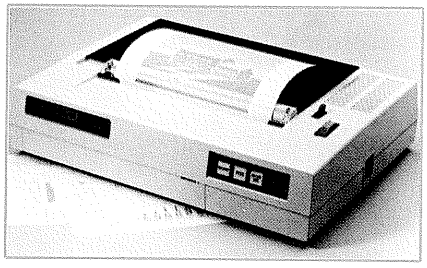
Link-Labels

A new combination diskette label and storage envelope is available for 5-1/4 and 8-inch diskettes. Link-Labels use a two-part, serialized sticker label to "link" individual diskettes to specific envelopes. The labels are available in five different colors and special serial numbering for inventory or personalized use can be custom printed. Volume pricing begins at 59 cents each, packaged in lots of 12, and a trial sample is available in either size for $2 postpaid. Complete details and order forms free from the maker; Hexco, Inc., P.O. Box 199-003, Hunt, TX 78024.

Soundplus

Soundplus has an amplifier and speaker to reproduce software-generated sound from games and other Model I, III, and 4 programs. It can also monitor cassette signals to determine the start of programs or data dropout. The device also provides 300-baud serial communications for terminals, printers, modems and other RS-232 devices. A communications program designed for use with Soundplus called Complus is also available. All Soundplus features are switch selectable. The unit measures 5 X 5 X 2.5 inches and sells for $79.95 plus $4 shipping. Contact Beaver Electronics, P.O. Box 13291, Salem, OR 97309.

CGP-220 ink-jet color printer



MicroSentry

Memory Correct III Typewriter

Smith-Corona's Memory Correct III Messenger portable electronic typewriter can double as a computer printer. A plug-in interface unit makes the letter-quality typewriter compatible with virtually all personal and small business computers. As a typewriter, the Memory Correct III Messenger features full-line correction, automatic relocation after correction, multiple 10, 12, or 15 character per inch spacing, reverse tab, automatic centering and underlining. The typewriter has a suggested retail price of $599 and the Messenger Module, which is required for computer interfacing, sells for $170. Contact Smith-Corona, 65 Locust Avenue, New Canaan, CN 06840 (203) 972-1471.

Model 4 Lazy Writer

AlphaBit Communications, Inc. has a new version of the Lazy Writer word processing system tailored to the Model 4. It makes use of the 80 X 24 video and comes in two versions. Buyers of the Model 4 version will receive one set for use on any Model III DOS and another to use with TRSDOS 6.0. Current Lazy Writer users can purchase the new Model 4 programs for $39.95. The price to new buyers is $175. Versions for the Lobo MAX-80 are also available at the same price. Contact AlphaBit Communications, Inc., 13349 Michigan Ave., Dearborn, MI 48126 (313) 581-2896 or local dealers.

Ink-Jet Color Printer

The TRS-80 CGP-220 Ink-Jet Printer can print text and graphics in seven non-smearing colors (black, red, green, yellow, blue, magenta, and violet). It prints2600 dots per second in graphics mode with a resolution of 640 dots per line. In text mode it prints 37 characters per second at 12 characters per inch. The printer has parallel and serial (600/2400 baud) interfaces. The printer sells for $699 and replacement ink packs sell from $9.95 to $14.95. Roll paper is recommended for best print quality but it will also handle 8-1/2 by 11-inch sheet paper. Contact local Radio Shack Computer Centers or participating stores and dealers for more information.

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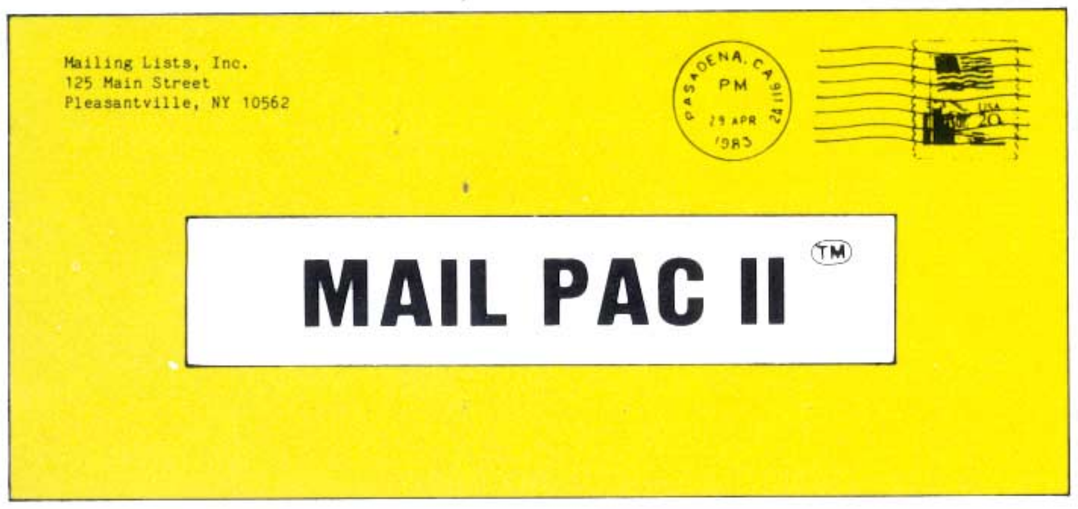

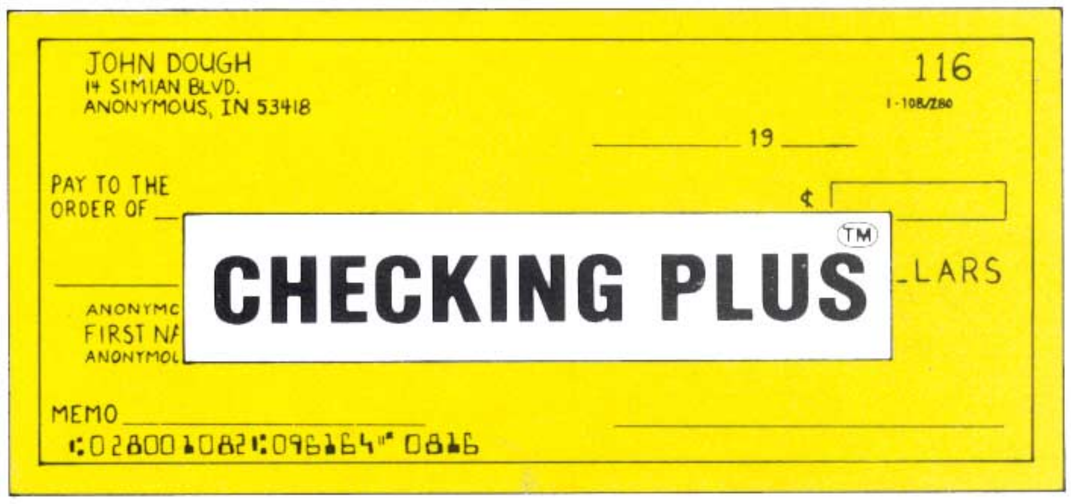

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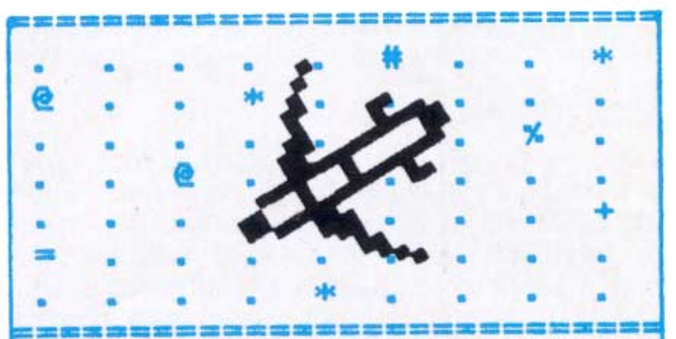

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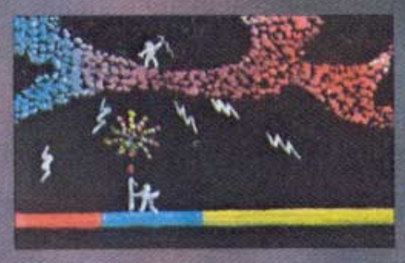

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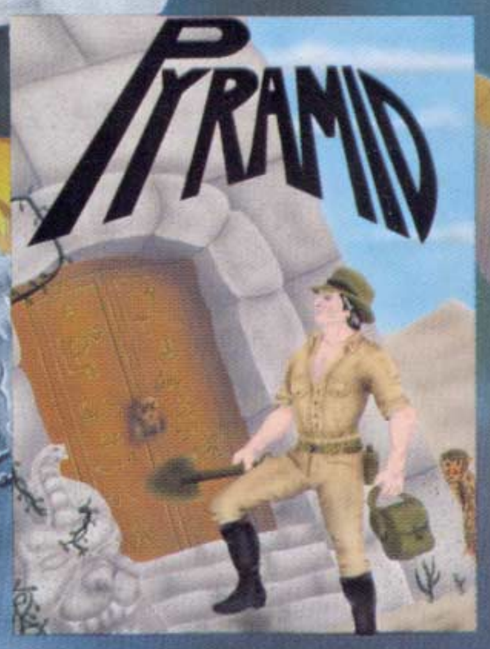

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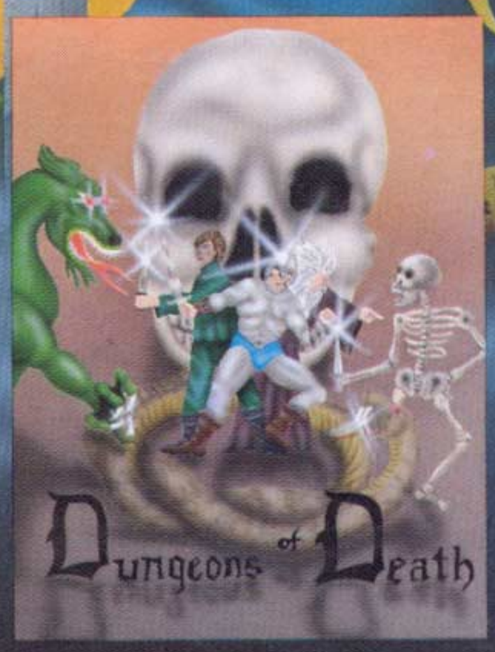

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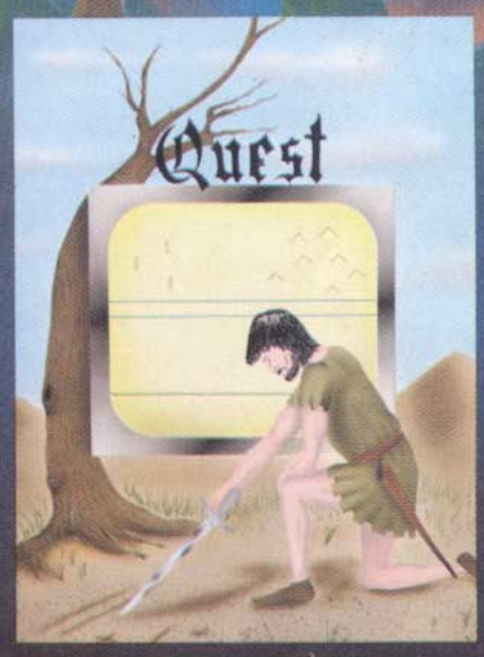

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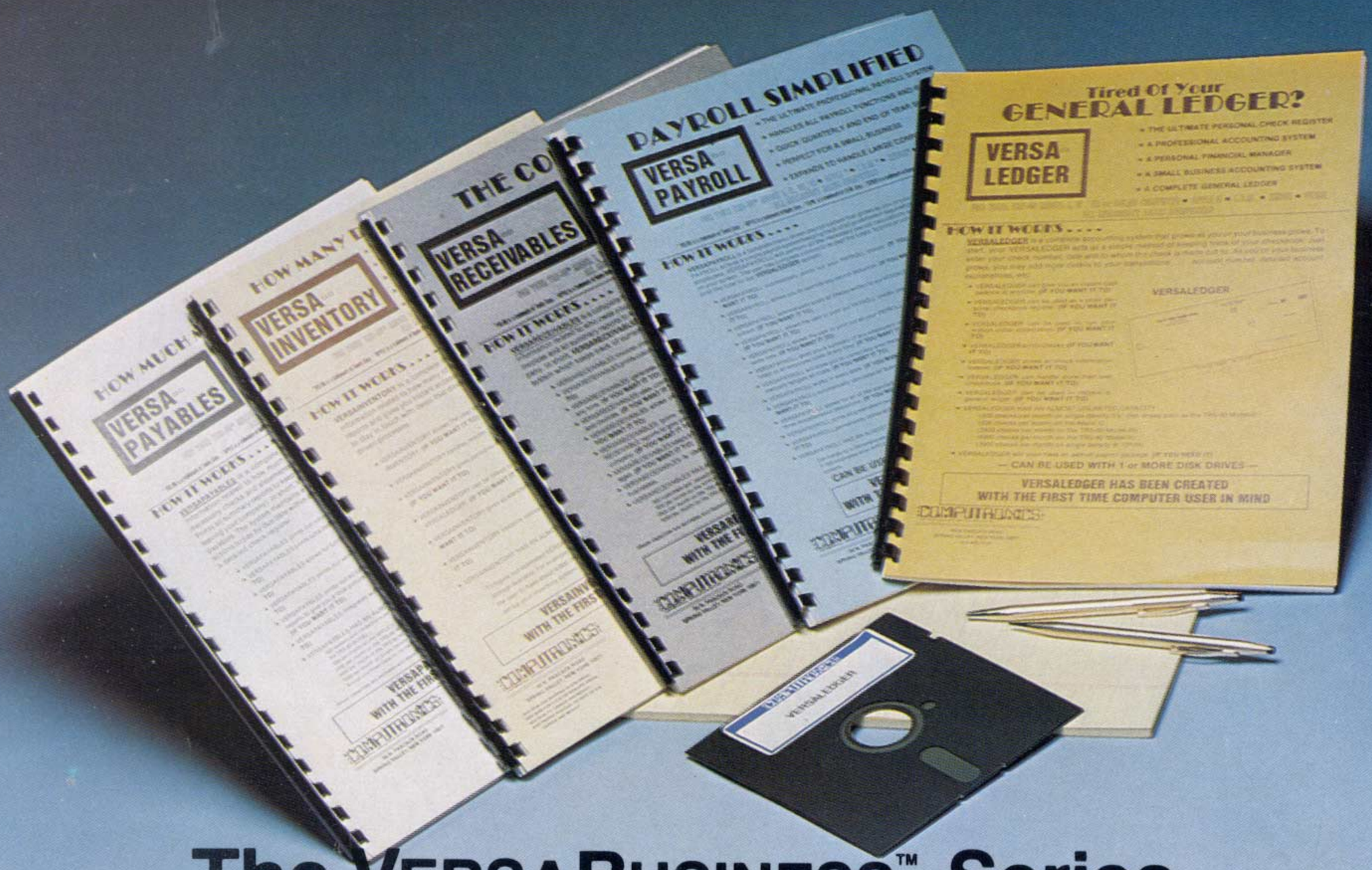

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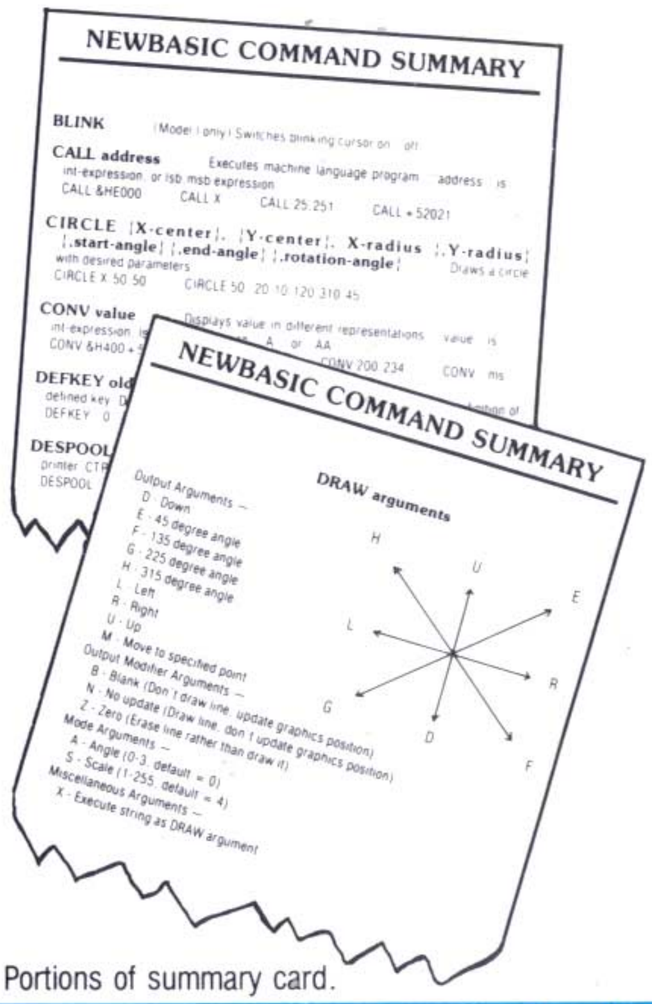

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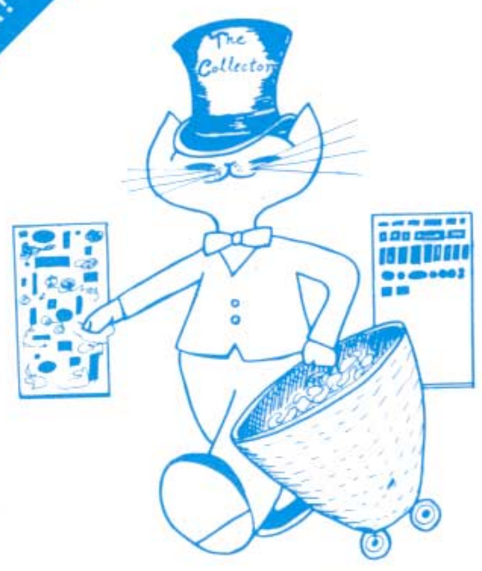

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