FEBRUARY, 1982
ISSUE NUMBER 42

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THE ORIGINAL MAGAZINE FOR TRS-80™* OWNERS

H&E COMPUTRONICS INC.

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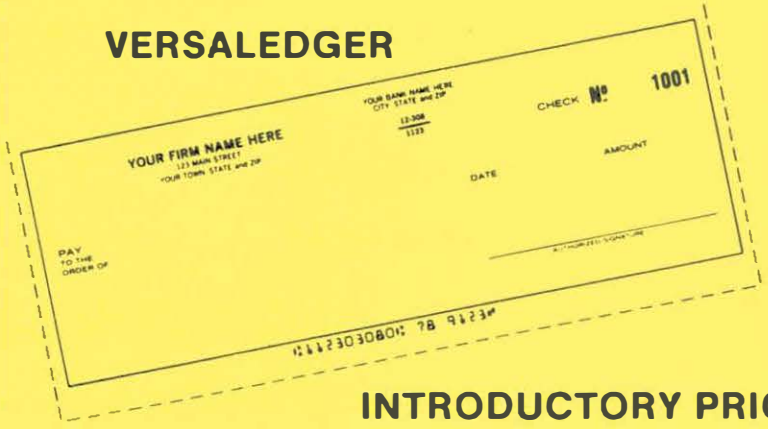

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ON THE COVER.
A computer user is relieving his frustrations by using the new H&E Computronics, Inc. Versaledger Program. The Versaledger represents the first in a new generation of software to be released by Computronics. Versaledger is well documented and made with the beginning computer owner in mind. Although geared toward the beginner, the Versaledger can be expanded to replace any of the present complicated general ledger programs (see inside front cover for additional information).

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Howard Y. Gosman

Software Catalogue #8

Our latest software catalogue is now available and will be sent free to any new or renewal subscribers on request. It is 64 pages long and lists hundreds of software products for all models of the TRS-80 computers. Be sure to get your copy soon!

The variety and quality of software products for the TRS-80 computers are truly amazing. Considering that the machines are only a few years old, we have really covered much ground since this publication was founded. At that time, over three and one-half years ago, you had to struggle to find any software that would do what you wanted. Now you have many products to choose among, and the important question becomes more how to get the greatest value for your money. We have evaluated every software product that we sell, and we believe that we carry those items that are truly the best of their kind available. We have actually investigated and decided against carrying, or have stopped carrying, a greater number of products than we now carry.

Radio Shack's Repair Policies

Did you know that if you buy a TRS-80 and, for any reason, have to have it repaired under the warranty, the store owner has to pay for the repairs? If you understand that the store owner is also making a profit (over and above the profit made

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The purpose of the *H & E COMPUTRONICS MONTHLY NEWS MAGAZINE* is to provide and exchange information related to the care, use, and application of the TRS-80™ computer systems. H & E COMPUTRONICS, Inc. does not take any financial responsibility for errors in published materials. Users are advised to check and edit vital programs carefully.

The H & E COMPUTRONICS MONTHLY NEWS MAGAZINE encourages comments, questions, and suggestions. H & E COMPUTRONICS will pay contributors for articles and programs published in the magazine.

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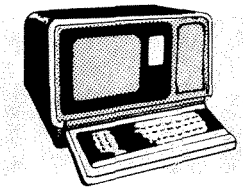

If you have anything to do with the TRS-80* System you should be reading the

EIGHTY SYSTEM NEWSLETTER

every week!

Don't miss a single issue of the new Eighty System Newsletter... published weekly and mailed every Friday by First Class Mail. This is the only publication designed for personnel in the TRS-80* industry, including manufacturers, distributors, dealers and computer users. The Eighty System Newsletter is compiled and edited by Ken Gordon, producer of the National TRS-80* Show, the Eighty/Apple Show, the NJ Microcomputer Show, and publisher of the Amateur Radio Equipment Directory. Here is valuable information in professionally prepared format about TRS-80* hardware, software, peripherals, trends in the industry, and latest news. In addition, each weekly issue contains brief digests of articles related to the TRS-80* system appearing in over 100 computer related and general interest publications. This bibliography will save you both time and money in keeping up with articles in print on the TRS-80* computer system. The Eighty System Newsletter is a must for all active TRS-80* users, plus anyone involved in any way with the manufacturing, distributing or retailing of TRS-80* products.

Subscribe today: Mail the coupon with your check for $39 for the next 52 weekly issues (sent First Class Mail that's only 75¢ per week.) If for any reason you are not satisfied with the Eighty System Newsletter — we will refund the undelivered portion of your subscription.

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THE CRYSTAL BALL

(News and Rumors of Interest to TRS-80™ Owners)

1. Contrary to recent denials, Tandy is currently working on a **TRS-80 Model IV.** News of the new computer may be released any day, although it may not be announced for a long while yet. It will probably be based on the Motorola 68000 microprocessor, a 16-bit processor said to be superior to the Intel 8088 used by the IBM Personal Computer, although Zilog's Z-8000 processor is also under consideration.

The obvious motivation for the development of the new machine is to counter the new IBM Personal Computer. It will be aimed at the high end of the microcomputer market and will probably cost more than the TRS-80 Model II, but users will get a considerable improvement in performance by upgrading to the 16-bit processor. Tandy is considering 8-inch disk drives, with a set of up to four hard disk drives and a word-processing quality printer as standard options.

Software, however, promises to be a major problem, since most existing programs would have to be rewritten for the 68000. This is analogous to the situation Tandy found itself in with the Color Computer, which has very little software compared to the Models I-III, and much of that now available for the Color Computer has been written by outside programmers. Tandy has been making a major push to develop more software, and may try to bring in outside programmers in a more formal way, as IBM has done with its Personal Computer.

2. Tandy is considering developing, or merely "authorizing" a version of **CP/M** for the TRS-80 Model II, in order to allow business customers to take advantage of the software now available under CP/M. This rumor has been heard many times before, however, and all that has yet resulted is claims by Tandy that its TRSDOS is "superior".

Tandy is also rumored to be working on a version of **Visicalc** for the **TRS-80 Color Computer.**

3. **Apple Computer** has been a publicly traded stock for over a year at this time. When it was first introduced, it was one of the hottest items on the market. Now many people have been forced to reappraise Apple's strength, and it is regarded much more suspiciously by the investment community.

Apple has, nevertheless, maintained a strong position in the personal computer marketplace, despite many problems with its Apple III computer. Now that these problems have been ironed out, its position is likely to remain strong, if not improve. Investment analysts are forecasting a growth rate at between 50 and 70 per cent in 1982.

4. Tandy Corp. has signed an agreement with France's Matra SA to manufacture **TRS-80 Model III computers** in France. This will enable Tandy to sell Model IIIs at a more competitive price in France and other European countries, where import duties and shipping costs can considerably raise the retail price of computers manufactured in the United States.

5. Xerox, Wang, DEC, and several leading Japanese electronics manufacturers are all working on **very low-cost personal computer systems** aimed at the home market. The target price seems to be **under $1000.** That is, this would be the introductory price of a full 16 or 32K computer system, often including one disk drive. Most companies are using Z-80 microprocessors, but DEC is working with its own LSI-11.

continued on page 6

JUST IN! LATEST RELEASE FROM BIG FIVE

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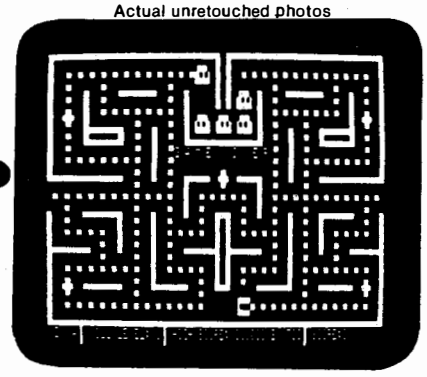

NEW!

SCARFMAN

THE LATEST ARCADE CRAZE now runs on your TRS-80.

It's eat or be eaten. You control Scarfman around the maze, gobbing up everything in your path. You attempt to eat it all before the monsters devour you. Difficulty increases as game progresses. Excellent high speed machine language action game. From The Cornsoft Group. With sound.

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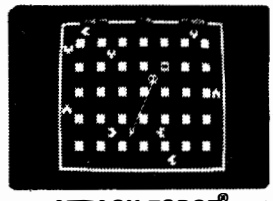

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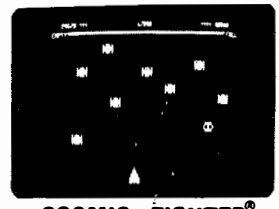

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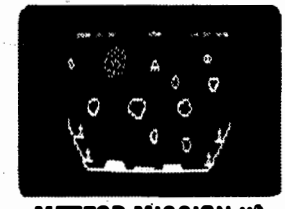
Your ship comes out of hyperspace under a convoy of aliens. You destroy every one. But another set appears. These seem more intelligent. You eliminate them, too. Your fuel supply is diminishing. You must destroy two more sets before you can dock. The space station is now on your scanner... With sound!



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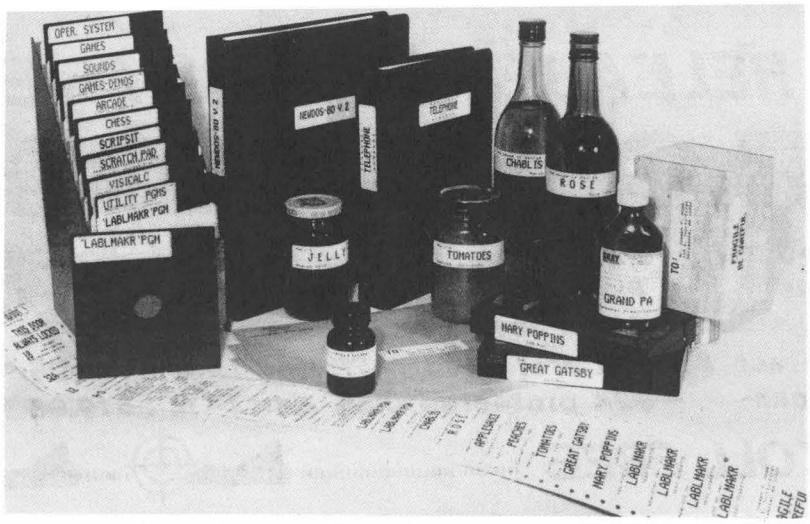

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continued from page 4

The Japanese companies are considering using the new 3-inch disk drives that have been developed in that country and which sell for under $100 wholesale, but these may be replaced by newer plastic versions of the standard 5-inch disk drives that can be sold at about the same price. Look for these computers to be announced by this summer.

continued from page 2

by the company) when he sells you the computer, then this may seem like a reasonable expense.

But what happens if you buy a TRS-80 in one state and then move to another? Now when you walk into your local Radio Shack store and present your computer for warranty repairs, a man who has made no profit on your computer has to pay for the repairs, essentially out of his own pocket.

This may seem to be a rare occurrence, but problems have been brewing for some time with regard to Radio Shack's policies because of the large number of mail-order sales of TRS-80 computers through Radio Shack authorized dealers, which are not stores. Authorized dealers sell TRS-80 computers at considerable discounts over stores, usually up to about 15% of the catalogue price. Radio Shack itself has allowed this system of stores competing with dealers to proliferate, and the parent corporation makes the same profit on any of its computers that are sold. The difference in price that you pay usually reflects the fact that the dealers are willing to sacrifice most of their profit margin because of their large volume of sales.

The main problem that customers face, then, is when a computer purchased from a dealer is presented for repair at a local store. The store manager is understandably reluctant to accept the computer for repair, since he has to pay for it himself, and will insist that you send it back to the dealer, often in another state. (People often buy from dealers in other states to avoid paying the sales tax.) The result is frustrated users, unnecessary delays in repairs, and bad feelings toward the local store managers.

Defects in computers are almost always a result of the manufacturing and are not caused by improper handling or care by the dealers who sell the computers. It seems silly for Radio Shack to perpetuate a policy that penalizes local personnel for manufacturing errors. This system may work for most of the items sold in Radio Shack stores, because the chance that a CB Radio, amplifier, or other electronic product will be defective is very slim. But when it comes to sophisticated items like computers, you

continued on page 8

GREEN LOOKS GOOD BUT AT THIS PRICE GREEN LOOKS GREAT!

This is the original **Crystal Green** filter for your TRS-80 model 1 video display. The **Crystal Green** filter is unlike any other filter. Here's why.

*Uses no tape, glue or adhesive of any type
*Only takes SECONDS TO INSTALL because it FITS on the display
*Easy on the eyes.
*U.S. patent pending.
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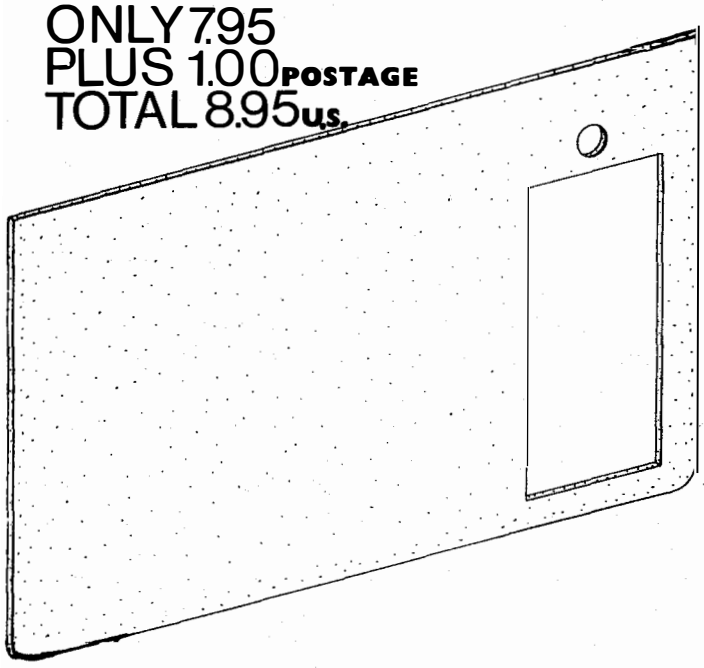

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CE...Create mode and edit.	LO...Display tune to LOok at.
PU...Put music in memory	TV...Goto LIGPEN routine.

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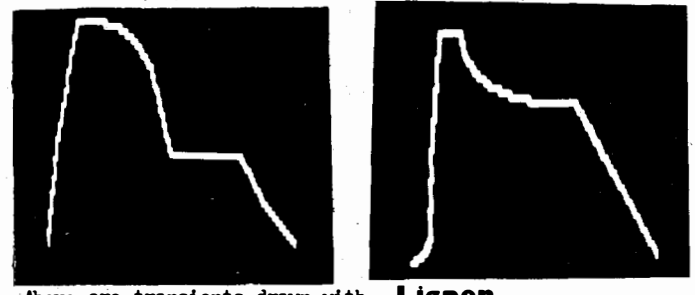

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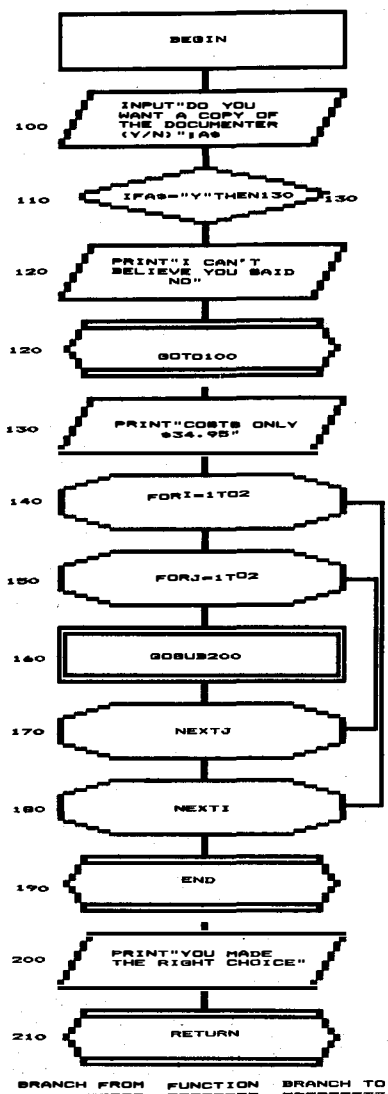

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continued from page 6

should consider the repair problems before they ever occur. Users have to establish a relationship with their local store owners or computer centers in order to survive. But at the present time, they also have to pay up to 15% extra for this privilege.

This seems like a problem that could be improved considerably by a few easy management decisions. As Radio Shack now faces stiffer competition from giant corporations like IBM and Xerox, maybe it will rethink some of these old practices in the hope of establishing better relationships with its customers.

Computer Crime

Is your computer equipped with telecommunications equipment that you use to "talk" to computer bulletin boards or time-sharing systems? Do you have teen-age children in your home who also use the computer for these purposes? If so, your computer may be an instrument in one or more of the newer computer crimes that are now appearing more and more in the country. Contrary to the image of computer crime as something carried out by sophisticated inside employees, it is turning out that many of today's perpetrators are high-school or college students who are doing it more for fun than to steal money or cause problems for major companies.

Consider these facts: experts estimate that only one per cent of computer criminals are ever caught, and that only a small percentage of their crimes are even discovered. But the most interesting piece of information is that almost all computer crimes are discovered by getting the perpetrators to confess, usually because they are promised immunity from prosecution if they will help authorities catch their accomplices or help the companies plug up the loopholes in their operations.

Recently a band of teen-agers managed to:

☐ shut down the Pacific Telephone Company's directory assistance service

☐ obtain records from the California Department of Motor Vehicles

☐ obtain confidential information from a major credit bureau's computer

☐ gain access to their school's computer to change grade transcripts.

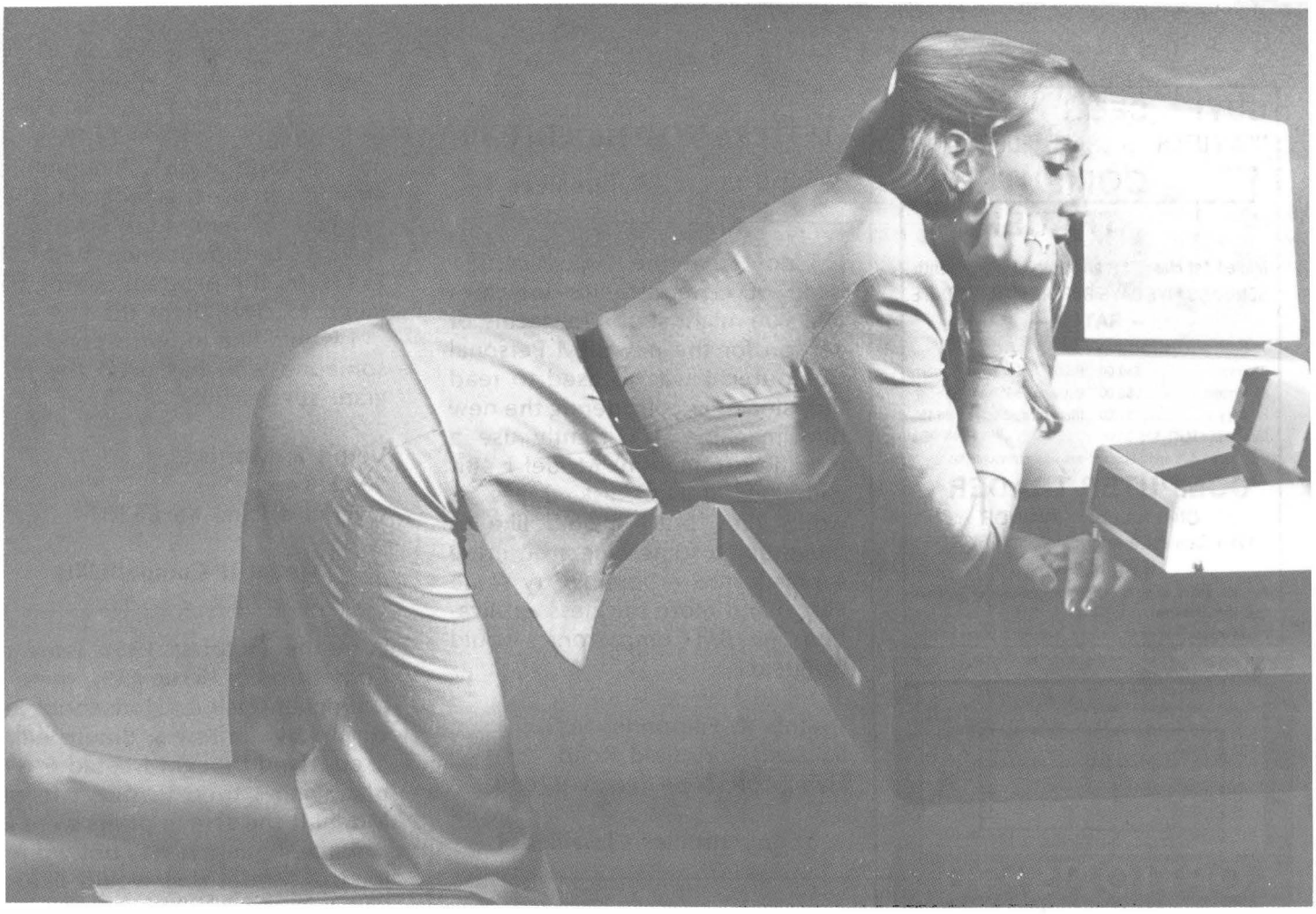
In order to accomplish these tasks, the "pranksters" spent hours rummaging through the garbage of major corporations looking for slips of paper with account numbers or other codes to try out on the computers. More daring individuals obtain these numbers and codes by posing as company employees, either on the telephone or in person.

There are now many clubs, electronic newsletters, and computer bulletin boards which people have used to arrange sexual encounters, trade equipment, and to exchange information about these electronic espionage and sabotage techniques. Often, people employ nickname identities, much like CB Radio users. Most of this communication is entirely clean and harmless, but the fact is that most computer criminals use these systems frequently. So if you answered "yes" to those questions above, perhaps you should periodically check up on your youngsters to see what they are actually doing with the computer.

No Beginner's Corner This Month

Due to an illness in the family, Sherry Taylor was unable to finish her *Beginner's Corner* column this month. It will be continued next month.

Dr. Howe reports also that the *Model III Corner* will be continued next month. ■



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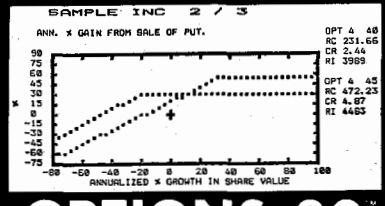

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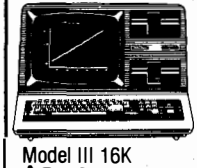
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LETTERS TO THE EDITOR

An IBM Computronics?

I note that the October 1981 issue of *Computronics* indicates that you might start a magazine or section for the new IBM Personal Computer. I was pleased to read this, since I'm considering the new IBM machine. I currently use a modified (Omikron) Model I 48K with two 8-inch disk drives. It works fine, but I would like to move up to something a bit more sophisticated — possibly try some Pascal and more business applications. An *IBM Computronics* would be great!

Dennis R. Filippone, M.D.
65 East Northfield Road
Livingston, New Jersey 07039

Computronics Classifieds?

After receiving *Computronics* for more than a year, I just had to write to you and tell you how much I enjoy reading your magazine. I enjoy the new format, the "color", and the articles.

I have one question: will you be devoting a portion of your magazine for personal classified ads? As you know, you can't TRADE IN your TRS-80 at Radio Shack, and I would like to sell my Model I, Level II and upgrade to a Model III.

I know that if you ever did start carrying personal classifieds, I would send in some things I would like to place in it.

Keep up the great job, your magazine is tops!

Brother Nicholas Lorson
St. Anthony-on-Hudson
Rensselaer, New York 12144

Check Maintenance Problems

Please advise me if the Check Maintenance Program contained in issue #32, pages 8-14, is available on tape or disk. A number of attempts to use this program failed because of numerous error messages. Correspondence with Bill Evans, Jr., the program author, has failed to clear them up.

I would like to correspond with someone who has used the program successfully.

Verne B. Morrison
9642 Roe
Overland Park, KS 66207

Model II Compatibility

In the October 1981 issue of *Computronics* (issue #39), there is a program called "Household Security" by Andrew S. Braunstein. I liked it and thought I could use it, but when I tried to put it in my Model II the screen prints were all garbage. I guess it was not written for the Model II. I would like to know if you have a copy for the Model II.

Lawrence A. Gamble
386 Hobart Drive
Newark, Delaware 19711

Most programs published in Computronics are written for the Models 1 and 3, but we try to maintain compatiblity with the Model II wherever possible. The problem of screen printing is a general one that you will face whenever you try to convert a Model I or III program to the Model II, and there are other general problems of a similar nature. In order to help users of all different models of the TRS-80, we will be starting a series on program conversions during the next several months.

TRSDOS 1.2 Errors

In the "Letters to the Editor" of issue No. 39, October 1981, page 12, Mr. Bill Apresti advises that

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TRSDOS version 1.1 for the Model III has been replaced by version 1.2 and that the former has several errors.

I would like to point out that version 1.2 does not operate properly with variable record lengths. It destroys part of the file when performing save operations. Version 1.3 is supposed to correct this error.

I have really enjoyed reading your magazine. The hints and information published in it have helped me solve several problems saving quite a bit of money at the same time. The addition of color has made it more attractive. Now it is not only good, it also looks good! Congratulations!

C. Roberto Linde
25 Calle 9-86, Zona 11
Granai & Townson II, Guatemala

Model II Conversion

I would like to offer several comments regarding Gordon Speer's article on the Model II.

(1) The proper syntax for an automatic entry to BASIC is: AUTO BASIC LOGO -F:3 -M:61021. This will load BASIC with three file buffers, set memory at 61021, and then run the program LOGO. (Note: this also works on the Model III.)

(2) If further processing is required before running the program, the BUILD command should be used. This lets you create an automatic command input file which can be executed via the DO command. The system executes the commands just as if they had been typed in from the keyboard. This can be done with the AUTO function. For example:

BUILD STARTUP <Enter>

FORMS (W=80) REM: Set width to 80 for LPIV <Enter>

PAUSE Insert Diskette #10 <Enter>

I <Enter>

RENAME INS TO OUTS <Enter>

BASIC LOGO -F:3 -M:61021 <Enter>

<Break>

AUTO DO STARTUP

DO files may be chained and are easily edited. Comments can be included if the proper syntax is used:

COMMAND (options) comment
PAUSE will wait for the operator to press <Enter> to continue. The I tells the system that you have changed diskettes, so that TRSDOS will read the diskette IDs on all drives in the system. (Note: this procedure is applicable to the Model III as well, but with two exceptions: DO files cannot be edited directly, and the I command is not required.)

(3) A few more interesting features of Model II BASIC are:

SYSTEM "SCREEN" copies the screen to the printer and can be executed within a BASIC program.

NAME OLDNAME TO NEWNAME allows you to rename a disk file WITHOUT returning to TRSDOS.

ERASE deletes arrays to free memory or so that they can be redimensioned.

SWAP exchanges values of variables.

HEX$ computes a hexadecimal value.

SPACE$ (LENGTH) prints a line of spaces of a given length.

SPC (NUMBER) prints a line of blanks but does NOT use string space.

INPUT$ (LENGTH) inputs a specified number of characters.

(4) The limitation of 110 baud for ASCII data transfer is not at all realistic! The software Mr. Speer mentions ALREADY exists in the Model II as a TERMINAL utility. We currently transfer at 300+ baud (the arrow keys on the Model II will speed up or slow down the transfer rate) between a Model II and a Model III. This is not much to brag about, but is quite an improvement over 110 baud.

My limitation is due to the use of a BASIC RS232 driver program in my Model III. This became a necessary evil when my not-so-smart terminal program would not do the job and my resourceful patch for Model I ST80D decided to patch into my DOS! If you think using six different terminal utilities on three different machines can be confusing, just ask me how many DOS's I have for my Model III! (That's another story!)

I hope that these comments will be helpful to Gordon Speer and other users new to the Model II. Maybe the teacher will reconsider and give the Model II a straight A (like he gave a student in his microcomputer class).

A dedicated TRS-80 user,

Robert D. Benson
402 Rose Street
Walnut, IL 61376

* * * * *

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PRACTICAL BUSINESS PROGRAMS

S. M. Zimmerman, Ph.D. and L. M. Conrad

THE GRAPHIC PIE

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This program, while very simple in its operation and design, graphically depicts decimal equations or percentages for rapid comprehension and understanding at all ages.

This program will plot any number of divisions of a pie (circle) on the CRT, then copy the results on your printer if you so wish. The accuracy of the drawing is excellent for areas that are .05 (5%) or greater, while smaller areas will lack the same accuracy. One other problem that could arise is the printing of one set of descriptive material over another, most particularly when the division of the pie area is near the vertical.

This program can be used as a teaching aid in school or it can also be found very useful in business applications requiring graphic illustrations.

RUNNING THE PROGRAM

The graphic pie program is very simple to run and is limited to a few questions. After typing RUN and hitting the ENTER key, you will see on the CRT:

```
                THE GRAPHIC PIE
     DEVELOPED BY STEVEN M. ZIMMERMAN, PH.D.,
              & LEO M. CONRAD  1981

MINIMUM INCREMENTS TO APPROXIMATELY 5%

NUMBER OF PIECES OF PIE ?
```

Here you will enter the number of sections you wish to divide the pie into. For our sample run we are using five sections, therefore we type in 5 right after the question mark as our answer so it now looks like:

```
NUMBER OF PIECES OF PIE ? 5
```

Since we have chosen to divide the pie into five sections we will now be asked to provide a name and a percentage as a decimal for each of the five pieces. Here we have chosen to name the pieces DAVE, BOB, STAN, MOM and DAD, as in a family.

We have set the division of portions of the pie in the decimal equivalent of percentages so they total 100%; .40 (40%), .25 (25%), .20 (20%), .08 (8%), and .07 (7%).

The questions you see appear after you answer how many pieces of pie you wish to divide the circle into will be:

```
FOR PIECE 1 NAME, PERCENTAGE AS DECIMAL ?
```

This question will be repeated for each division or piece of pie you have requested. All you have to do is type in the name and the decimal amount after the question as:

```
FOR PIECE 1 NAME, PERCENTAGE AS DECIMAL ? DAVE,.20
FOR PIECE 2 NAME, PERCENTAGE AS DECIMAL ? DAD, .05
FOR PIECE 3 NAME, PERCENTAGE AS DECIMAL ? BOB,.20
FOR PIECE 4 NAME, PERCENTAGE AS DECIMAL ? MOM  ,.25
FOR PIECE 5 NAME, PERCENTAGE AS DECIMAL ? STAN,.30
```

NOTE: Be sure to hit the ENTER key after typing in the name and the decimal amount!

There is an error checking routine at this point. If the sum of the values is not between 95% and 100%, the program will give an error message and force the user to recycle through the above questions. If the sum is within the parameters, you will then be asked if you wish a hard copy (printout). If you answer yes, you will then be asked for some identification information. These questions are:

```
HARD COPY (Y/N) ?

TITLE, DATE, OPERATOR ?
```

Here we answered Y or yes to the first question by typing in the Y just after the question mark and then hitting the ENTER key. This sets up the machine to printout on the printer what you will also see on the screen.

In answering the second question we titled the graphic illustration FAMILY, typed it in followed by a comma, then the DATE (MO/DA/YR) we printed the illustration, again followed by a comma, and then we added the name of the person who operated the program. After typing in the name you hit the ENTER key.

When you hit the ENTER key you then found one more question appeared on the CRT:

```
EXPANDED FORMAT (Y/N) ?
```

This is the final question before the execution of the program, and it is to give you a choice of NORMAL or

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*TRS-80 is a product of Radio Shack, div. of the Tandy Corp.

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EXPANDED format printing. The NORMAL format is a compressed copy of what you see on the CRT. The EXPANDED format will print the diagram at approximately the same size as you see on the CRT.

Type in your answer, Y for EXPANDED printout format, or N for the NORMAL or reduced format, behind the question mark and make sure your printer is ON and ready to run before you hit the ENTER key.

Because the output fills the CRT you may find the graphics will destroy the descriptive material or informational data written on the screen. You will wish to experiment with different lengths of descriptions and even alternative ordering of the pieces of pie in order to obtain the best picture for a particular application.

```
10 CLEAR 300: REM "PIE"
20 CLS
30 PRINT "THE MONEY PIE"
40 PRINT
50 PRINT" DEVELOPED BY: Steven M. Zimmerman,Ph.D.": PRINT"
          & LEO M. CONRAD  1981"
60 PRINT
70 PRINT "MINIMUM INCREMENTS TO APPROXIMATLY 5%"
80 PRINT
90 INPUT "NUMBER OF PIECES OF PIE ";P%
100 DIM PP(P%),SS(P%),SX(P%),N$(P%)
110 SUM=0
120 FOR I%=1 TO P%
130 PRINT "FOR PIECE ";I%;: INPUT" NAME, PERCENTAGE AS
DECIMAL";N$(I%),PP(I%)
140 SUM=SUM+PP(I%)
150 NEXT
160 IF SUM<.999 OR SUM>1.001 THEN PRINT "SUM IS NOT 100%":
GOTO 110
170 INPUT "HARD COPY (Y/N)";Y$: IF Y$="N" THEN 210
180 IF Y$<>"Y" THEN 170
190 INPUT "TITLE, DATE, OPERATOR";T$,D$,O$
200 INPUT "EXPANDED FORMAT (Y/N)";F$
210 SX(0)=0
220 FOR I%=1 TO P%
230 SS(I%)=PP(I%)*100
240 SX(I%)=PP(I%)+SX(I%-1)
250 NEXT
260 REM WRITING DESCRIPTIVE MATERIAL FIRST QUARTER
270 V%=1:Z%=P%: CLS: FOR A=1 TO 5: FOR I%=Z% TO V% STEP-1:
B=A*.05: IF SX(I%)<=B AND SX(I%)>B-.05 THEN PRINT
@(46+(64*(A-1))+A),I%;" ";N$(I%);" ";SS(I%);"%";: V%=V%+1
280 NEXT I%,A
290 REM WRITING DESCRIPTIVE MATERIAL SECOND QUARTER
300 FOR A=1 TO 5: FOR I%=Z% TO V% STEP -1: B=A*.05+.25:
IF SX(I%)<=B AND SX(I%)>B-.05 THEN PRINT @(561+(64*A-1)-A),I%;"
";N$(I%);" ";SS(I%);"%";: V%=V%+1
310 NEXT I%,A
320 REM WRITING DESCRIPTIVE MATERIAL THIRD QUARTER
330 FOR A=1 TO 5: FOR I%=Z% TO V% STEP -1: B=A*.05+.5: IF
SX(I%)<=B AND SX(I%)>B-.05 THEN PRINT @(960-(64*A-1)),I%;"
";N$(I%);" ";SS(I%);"%";: V%=V%+1
340 NEXT I%,A
350 REM WRITING DESCRIPTIVE MATERIAL FOURTH QUARTER
360 FOR A=1 TO 5: FOR I%=Z% TO V% STEP -1: B=A*.05+.75: IF
SX(I%)<=B AND SX(I%)>B-.05 THEN PRINT @(384-(64*A-1)),I%;"
";N$(I%);" ";SS(I%);"%";: V%=V%+1
370 NEXT I%,A
380 IF I%<P% THEN PRINT@1,P%;" ";N$(P%);" ";SS(P%);"%"
390 REM CIRCLE/PIE DRAWING ROUTINE
400 S=.5:II=2:R=39:K=1
410 FOR X=-R TO R STEP S: Y=SQR(R*R-X*X)/2: IF K<0 LET Y=-Y
420 SET(X+57,Y+23): NEXT X: K=-K: R=-R: S=-S: IF II=2 THEN II=1:
GOTO 410
430 REM LINE DRAWING ROUTINE
440 FOR I%=23 TO 3 STEP-1: SET(58,I%): NEXT
450 FOR I%=1 TO P%-1: IF PP(I%)>.25 THEN 510
460 REM FOR FIRST QUARTER LINES
470 ST=0: Y=23: FOR X%=58 TO 94: Y=Y-((.25-PP(I%))*5): IF X%>65
THEN GOSUB 730
480 IF ST=1 THEN 680  ELSE GOSUB 710
490 NEXT : GOTO 680
500 REM FOR SECOND QUARTER LINES
510 IF PP(I%)>.50 THEN 580
520 Y=23: IF PP(I%)>.47 THEN X%=58: FOR J=1 TO 19: SET(X%,Y+J):
GOTO 560
530 ST=0: Y=23: FOR X%=58 TO 97: Y=Y+((PP(I%)-.25)*4): IF X%>65
GOSUB 730
540 IF ST=1 THEN FOR J=1 TO 3: Y=Y+((PP(I%)-.25)*4):
SET(X%+J,Y): NEXT : GOTO 680
550 GOSUB 710
560 NEXT : GOTO 680
570 REM FOR THIRD QUARTER LINES
580 IF PP(I%)>.75 THEN 640
590 Y=23: IF PP(I%)<.53 THEN X%=58: FOR J=1 TO 18: SET(X%,Y+J):
GOTO 620
600 ST=0:Y=23: FOR X%=58 TO 20 STEP-1: Y=Y+((.75-PP(I%))*4):
IF X%<48 THEN GOSUB 750
610 IF ST=1 THEN 680 ELSE GOSUB 710
620 NEXT : GOTO 680
630 REM FOR FOURTH QUARTER LINES
640 ST=0: Y=23: FOR X%=58 TO 22 STEP-1: Y=Y-((-.75+PP(I%))*4):
IF X%<40 THEN GOSUB 750
650 IF ST=1 THEN FOR J=1 TO 3: Y=Y-((-.75+PP(I%))*4):
SET(X%-J,Y): NEXT : GOTO 680
660 GOSUB 710
670 NEXT
680 PP(I%+1)=PP(I%+1)+PP(I%)
690 NEXT I%
700 IF Y$="N" THEN 700 ELSE GOTO 780
710 IF X%>0 AND X%<127 AND Y>0 AND Y<47 THEN SET(X%,Y)
720 RETURN
730 FOR S=1 TO 2: FOR SS=1 TO 3: IF POINT(X%+SS,Y+S)=0
THEN NEXT SS,S: RETURN
740 ST=1: RETURN
750 FOR S=1 TO 2: FOR SS=1 TO 3: IF POINT(X%-SS,Y-S)=0
THEN NEXT SS,S: RETURN
760 ST=1: RETURN
770 REM HARD COPY ROUTINE ***** COPIES ALL ON SCREEN *******
```

continued on page 26

Not all Spelling Checkers are the same.

MICROPROOF™ stands out!

EASY TO USE: Prepare your text on any Z-80 based microcomputer, using any of a number of popular word processing programs. When you are finished, enter the appropriate command, and MICROPROOF proofreads your document, displaying misspellings and typos on the screen. Then correcting MICROPROOF can display each error separately, requesting you to enter the correct spelling for each. You are also given the option of displaying errors in context or adding words to MICROPROOF's 50,000 word vocabulary. Finally, MICROPROOF corrects your document. All in less than a minute.

```
SELECT APPROPRIATE RESPONSE:

CORRECT MISSPELLED WORD:    ENTER CORRECT WORD
LEAVE WORD "AS IS":         HIT <ENTER> KEY
DISPLAY WORD IN CONTEXT:    ?
ADD WORD TO DICTIONARY:     +
EXIT:                       !

WORD:          (Your error)
RESPONSE:
```

Correcting MICROPROOF Screen Display

SPEED is the single most important factor in a dictionary program. All dictionary programs will find your potential errors but if the program is too slow, you are not likely to use it. MICROPROOF's speed is outstanding. It can proofread a several page letter in 20 seconds.

LOW PRICES: Standard MICROPROOF is available for either $89.50 (TRS-80® Models I or III) or $149.50 (CP/M®, TRS-80® Model II and all others). The optional correction feature can be added at any time for an additional $60.00. Optional patches to integrate MICROPROOF into your word processing software can also be added at any time for an additional $35.00. (Integration patch not needed for Wordstar®.)

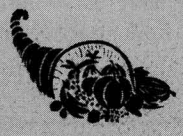
MICROPROOF'S FULL 50,000 WORD VOCABULARY saves you time and allows you greater confidence in the lists of potential errors that MICROPROOF identifies. The mini-dictionary programs, with their 10,000 and 20,000 word vocabularies, have many correctly spelled words omitted from their vocabularies. Consequentially, they identify as potential "errors" many words that are actually spelled correctly; five to ten times as many such words as does MICROPROOF. So, when you use MICROPROOF you will have far fewer extra words to evaluate, a major time savings. There will be less need to look up words in order to verify that they are in fact spelled correctly. The extra 30,000 words in MICROPROOF's vocabulary assures you confidence in the error lists that MICROPROOF generates.

There are other proofreading programs available to choose from. Since MICROPROOF became available in December of 1980, a number of companies have announced programs with small dictionaries. It took us almost two years to develop MICROPROOF. During that time we were able to compress our full 50,000 word dictionary into a manageable size (fits on one single density 5¼ inch disk). And we were able to design a proofing program which operates remarkably fast. The chart below illustrates the comparative advantages of MICROPROOF.

ADVANTAGES OF MICROPROOF

	MICROPROOF DICTIONARY SOFTWARE	OTHERS (Mini-Dictionaries)
DICTIONARY SIZE	50,000 Words	20,000 Words
DISK SPACE REQUIRED FOR DICTIONARY	70,000 BYTES (fits easily on one 5¼" disk)	170,000 BYTES
DICTIONARY ENLARGEMENT	VIRTUALLY UNLIMITED	EXTREMELY LIMITED
SPEED—400 Words	20 Seconds	1 to 5 Minutes
SPEED—3,000 Words	1 Minute	2 to 10 Minutes
CORRECTION FEATURE	Optional	Not Available

See your local microcomputer dealer or write to:



CORNUCOPIA SOFTWARE

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MORTGAGE COMPARISONS

Dan L. Ward

The steady rise in home values has given owners some substantial increases in their equity. At the same time, the increases in interest rates have left financial institutions with a lot of money tied up in older low-interest loans. These institutions are now seeking ways to encourage home owners to refinance their mortgages at today's higher rates.

One of the latest strategies is to offer to refinance a mortgage at a higher level, thereby giving the home owner a chance to cash in some of that equity. Here's how it works:

In 1977, a man sought a home with a $50,000 mortgage for 30 years at 8.5% interest. The lenders now say they will refinance the mortgage for $60,000 for 30 years at 13.5% interest. Since the borrower has already paid the principle down to $48,000 over the past four years, he would pocket $12,000 in the deal ($60,000-$48,000).

Another option would be for the individual to keep the old mortgage and borrow $12,000 using his home equity as collateral. He could do this at 16% interest on a 12 year loan.

Which is cheaper? This program will provide that answer. It calculates the equivalent costs of the two options: (1) keeping the original mortgage and taking an equity loan, versus (2) refinancing the total amount. The answer may surprise you. There is a difference of over $100,000 in the interest charges for those two examples!

This program only covers the basics. A more sophisticated analysis would include the impact of tax deductions for the interest paid, as well as the investment value of the cash flows. The program also assumes that there is no prepayment penalty or new closing costs. It can obviously be expanded to a more sophisticated model. As it is, it supplies a quick and easy way to make a general comparison.

The program is user-oriented with prompts and instructions. If you or one of your friends are considering cashing in some of your home equity, this program could save you a hundred thousand dollars! Try it and see.

```
100 REM MORTGAGE COMPARISONS
120 REM BY DAN WARD
140 REM 421 BETH AVE , WINSTON-SALEM, NC 27107
160 CLEAR 200
180 CLS : PRINT  , "MORTGAGE COMPARISON PROGRAM":PRINT
200 PRINT "TO OPERATE THE PROGRAM, YOU WILL BE ASKED TO"
220 PRINT "INPUT DATA FOR THE CURRENT MORTGAGE AND THE AMOUNT"
240 PRINT "TO BE FINANCED UNDER AN EQUITY LOAN."
260 PRINT  "THEN ENTER THE DATA FOR REFINANCING THE MORTGAGE",
280 PRINT "AT THE NEW HOME VALUE AND INTEREST RATE."
300 PRINT "THIS ALLOWS YOU TO COMPARE THE ADVANTAGE OF"
320 PRINT "USING A CURRENT MORTGAGE AND AN EQUITY LOAN"
340 PRINT "OR GETTING THE TOTAL AMOUNT THROUGH REFINANCING."
360 PRINT : PRINT : INPUT "HIT ENTER TO CONTINUE";X1$
380 A$ = "$$#,###,###.##": DEFINT I
400 CLS : PRINT "    FOR THE OLD MORTGAGE :"
420 PRINT "(USE NUMBERS REFLECTING THE CURRENT STATUS)"
440 I = 1
460 GOSUB 1200
480 CLS : PRINT "    FOR THE EQUITY LOAN :"
500 I = 2
520 GOSUB 1200
540 CLS : PRINT "    FOR THE NEW MORTGAGE :"
560 I = 3
580 GOSUB 1200
600 REM PRINT STATEMENTS FOR OUTPUT
620 CLS : PRINT "         COMPARISON OF THE MORTGAGES"
640 PRINT STRING$(60,58)
660 PRINT ,"  OLD MORTGAGE"," EQUITY LOAN","NEW MORTGAGE"
680 PRINT "MONTHLY PYMT" ,
700 PRINT USING A$; S(1)  , S(2) , S(3)
720 PRINT "MORTGAGE AMT.",
740 PRINT USING A$; M(1) , M(2) , M(3)
760 PRINT "TOTAL INT.",
780 PRINT USING A$; T(1) , T(2) , T(3)
800 PRINT "RATE & (TERM)", R(1);"  (";Y(1);")",R(2);"  (";
820 PRINT Y(2);")", R(3);" (";Y(3);")"
840 PRINT STRING$(60,58)
860 GOSUB 1460
880 PRINT TAB(13)"MORTG + EQTY LOAN","NEW MORTGAGE"
900 PRINT "MONTHLY PYMT",
920 PRINT USING A$;S(1)+S(2),S(3)
940 PRINT "TOTAL INT",
960 PRINT USING A$;T(1)+T(2),T(3)
980 PRINT "TOTAL AMOUNT",
1000 PRINT USING A$;M(1)+M(2),M(3)
1020 PRINT "THE DIFFERENCE IN MONTHLY PAYMENTS IS ",
1040 PRINT USING A$; (S(1)+S(2))-S(3)
1060 PRINT "THE DIFFERENCE IN TOTAL INTEREST IS ",
1080 PRINT USING A$; (T(1)+T(2))-T(3)
1100 PRINT
1120 FOR I = 1 TO 2000 : NEXT I
1140 INPUT"DO YOU WANT TO RUN AGAIN? (Y/N)"; Z1$
1160 IF Z1$ = "Y" THEN 180
1180 CLS : END
1200 REM SUBROUTINE FOR INPUT
1220 PRINT : PRINT
1240 PRINT "ENTER AMOUNT TO BE FINANCED"
1260 INPUT "FOR EXAMPLE: $65,000 = 65000)";M(I)
1280 PRINT
1300 INPUT "ENTER TOTAL LENGTH OF LOAN IN YEARS"; Y(I)
1320 PRINT
1340 PRINT "ENTER INTEREST RATE USING DECIMALS"
1360 INPUT "(FOR EXAMPLE, 8.5% = .085 , 10% = .10)"; R(I)
```

continued on page 22

COMPASS SOFTWARE

THE DUNGEON MASTER'S APPRENTICE

CHARACTER GENERATION

RELIEF for Dungeon Masters and would-be Dungeon Masters the world (and other worlds) over. The popularity of role playing games, and particularly of AD&D™, is unquestioned. The real question is how many *more* people would get involved if the systems weren't so time-consuming. The Dungeon Master's Apprentice series solves that and more. In less time than it takes to cast a Wizard Eye, Module 1 - CHARACTER GENERATION creates new player characters following *all* the rules and guidelines of the game system including special abilities, bonuses, penalties, spells, user-defined possessions, skills and more. Simply, everything anyone would use in a campaign is treated, and all without taking the dice or the decisions out of the hands of the participants. We've designed this dual program to run in minimum systems which makes it available to nearly everyone who owns, or will soon own a "personal" computer. And we've written the Dungeon Master's Apprentice in *basic* to allow user-updating as the game system changes. All results are viewable on video-monitor, printable to any system-compatible line printer, and recordable to file for integration with other modules in the series. Future modules dealing with every aspect of the game system are scheduled to be released at eight-week intervals.

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MANKALA- The Game of Pits and Stones- brings one of the world's oldest games to its newest medium. For 1 or 2 players, Mankala's two "levels of facility", three display formats and variable game length (number of stones) makes a game that will be interesting and useful for a long, long time. Our numeric format puts the game within the reach of children and helps them to understand how numbers work. While our "small" format simulates every facet of the original and will test both your foresight and your memory in this no-luck-involved game.

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Cassette versions require 16K *minimum*. Disks require 32K. Model I requires LEVEL II Basic.

AVAILABLE FROM YOUR LOCAL DEALER OR ORDER DIRECT FROM:

COMPASS SYSTEMS, INC.
Village Square Center, Box 388, E. Hampstead, New Hampshire 03826
(603)329-5603

STATEMENT OF INCOME

Richard Eidmann

I wrote this small program to assist me in my work as an accountant. The program is limited because it does not allow for correction of mistakes. It prints a professional-looking statement of income, and it loads in less than one minute at 500 baud. It has a few features that I use in all my accounting programs. One of these is the multiple calculator in lines 1240-1330, which allows the user to add 100 figures at that location and then return to the initial location ready to add another 100 figures under another name. In its present form the program runs slowly, but the speed can be greatly increased by packing it.

Another feature is the shorthand listing at lines 1550-1750, which prints a list of shorthand codes for the user. This could be eliminated to save typing time. Just delete all references to it.

Lines 1340-1530 hold the shorthand codes. The user can add any additional codes using the same format. This saves a great deal of typing and insures accuracy. Properly named, I suppose that this program could be called a word processor for numbers. For example, when the program requests the account name you can enter "INT" and it will print interest for that category. When you no longer wish to make any entries under the first section, just hit the "ENTER" key so that a null is recorded by the computer. Then hit the "ENTER" key under AMOUNT and the program will go to the next section. At the completion of the last section the computer will then print the entire report. In lines 1020-1070 the user can enter his own company name. All heading names will be centered by the Z-TAB feature.

This program runs on both the Model I and Model III. I use an Epson MX-80 printer and find that it prints an excellent report in the 80-character mode.

```
10 CLEAR 10000
20 CLS
30 DIM AA#(100), AN$(100), A#(100),  T#(100), B#(100)
40 DEFINT N, J, K, Z
50 Z1=40
60 Z2=60
70 U$="$$#,###,###.##"
80 X$="$#,###,###.##"
90 INPUT"DO YOU WANT A LIST OF THE SHORTHAND NAMES  (Y/N)";V$
100 IF V$="Y" THEN GOSUB 1550
110 CLS
120 PRINT"STATEMENT OF INCOME"
130 INPUT"ENTER THE NAME OF THE COMPANY";CN$
140 INPUT"THIS REPORT FOR (ENTER PERIOD ENDING DATE)";DA$
150 PRINT
160 PRINT" ENTER INCOME"
170 GOSUB 1250
180 IC#=A#
190 PRINT"COST OF SALES"
200 PRINT
210 REM *** CALCULATOR FOR COST OF SALES ***
220 PRINT"YOU MAY NOW ENTER YOUR  ACCOUNT NAMES"
230 N=N+1
240 INPUT"ENTER NAME";AN$(N)
250 GOSUB 1350
260 GOSUB 1250
270 AA#(N)=A#
280 T#(N)=A#
290 ST#=ST#+T#(N)
300 GP#=IC#-ST#
310 IF AN$(N)="": K=N: GOTO 330
320 GOTO 230
330 REM *** CALCULATOR FOR OPERATING EXPENSES ***
340 CLS
350 PRINT"OPERATING EXPENSES"
360 PRINT"YOU MAY NOW ENTER YOUR ACCOUNT NAMES"
370 N=N+1
380 INPUT"ENTER NAME";AN$(N)
390 GOSUB 1350
400 GOSUB 1250
410 AA#(N)=A#
420 B#(N)=A#
430 BT#=BT#+B#(N)
440 IF AN$(N)="" GOTO 460
450 GOTO 370
460 REM*** PRINTS REPORT ***
470 CLS
480 PRINT CHR$(23);"STANDBY WHILE THE COMPUTER PRINTS THE REPORT"
490 Z=(80-LEN(CN$))/2
500 LPRINT TAB(Z); CN$
510 LPRINT""
520 SI$="STATEMENT OF INCOME"
530 Z=(80-LEN(SI$))/2
540 LPRINT TAB(Z); SI$
550 LPRINT""
560 PD$="PERIOD ENDING"
570 Z=(80-LEN(PD$))/2
580 LPRINT TAB(Z); PD$
590 Z=(80-LEN(DA$))/2
600 LPRINT TAB(Z); DA$
610 LPRINT STRING$(80, 45)
620 FOR I=1 TO 5
630 LPRINT""
640 NEXT
650 LPRINT"INCOME";TAB(Z2); USING U$; IC#
660 LPRINT"-------"
670 LPRINT""
680 LPRINT"COST OF SALES"
690 LPRINT"---- ----------"
700 FOR J=1 TO K-1
710 LPRINT AN$(J); TAB(Z1); USING X$; AA#(J)
720 IF J=K THEN 740
730 NEXT
```

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MAILING SYSTEMS

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"I think the system will stand the test of time . . . it is probably the most sophisticated system around for the micros today"
Mike Schmidt (EDITOR) *80-US Jan/Feb pg. 94*

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Galactic software ltd.
11520 North Port Washington Road
Mequon, Wisconsin 53092

```
74Ø LPRINT"TOTAL COST OF SALES";TAB(Z2); USING U$; ST#
75Ø LPRINT"--------------------"
76Ø LPRINT TAB(Z2);"-----------------"
77Ø LPRINT""
78Ø GP#=IC#-ST#
79Ø LPRINT"GROSS PROFIT";TAB(Z2); USING U$; GP#
8ØØ LPRINT"-----------"
81Ø FOR I=1 TO 5
82Ø LPRINT""
83Ø NEXT
84Ø LPRINT STRING$(8Ø, 45)
85Ø LPRINT"OPERATING EXPENSES"
86Ø LPRINT"------------------"
87Ø LPRINT""
88Ø FOR J=K+1 TO N-1
89Ø LPRINT AN$(J); TAB(Z1); USING X$; AA#(J)
9ØØ NEXT
91Ø LPRINT""
92Ø LPRINT"TOTAL OPERATING EXPENSES";TAB(Z2); USING U$; BT#
93Ø LPRINT"----------------------"
94Ø LPRINT TAB(Z2);"-----------------"
95Ø LPRINT""
96Ø NP#=GP#-BT#
97Ø LPRINT"NET PROFIT OR LOSS";TAB(Z2); USING U$; NP#
98Ø LPRINT"================="
99Ø FOR I=1 TO 3
1ØØØ LPRINT""
1Ø1Ø NEXT
1Ø2Ø REM *** OUR COMPANY ADDRESS ***
1Ø3Ø SC$="SCHRADER AND COMPANY"
1Ø4Ø AT$="ACCOUNTANTS"
1Ø5Ø AD$="13Ø5Ø BUSTLETON AVENUE"
1Ø6Ø PH$="PHILADELPHIA PA"
1Ø7Ø PN$="215-677-6632"
1Ø8Ø Z=(8Ø-LEN(SC$))/2
1Ø9Ø LPRINT TAB(Z); SC$
11ØØ Z=(8Ø-LEN(AT$))/2
111Ø LPRINT TAB(Z); AT$
112Ø Z=(8Ø-LEN(AD$))/2
113Ø LPRINT TAB(Z); AD$
114Ø Z=(8Ø-LEN(PH$))/2
115Ø LPRINT TAB(Z); PH$
116Ø Z=(8Ø-LEN(PN$))/2
117Ø LPRINT TAB(Z); PN$
118Ø FOR I=1 TO 3Ø
119Ø LPRINT""
12ØØ NEXT
121Ø CLS
122Ø PRINT CHR$(23);"YOU MAY NOW ENTER ANOTHER PROGRAM"
123Ø END
124Ø REM *** SPECIAL CALCULATOR ***
125Ø A#=Ø
126Ø FOR A=1 TO 1ØØ
127Ø A#(A)=Ø
128Ø NEXT
129Ø FOR A=1 TO 1ØØ
13ØØ INPUT A#(A)
131Ø A#=A#+A#(A)
132Ø IF A#(A)=Ø THEN RETURN
133Ø NEXT
134Ø REM **** HOLDS SHORTHAND CODES ****
135Ø IF AN$(N)="PUR" THEN AN$(N)="PURCHASES"
136Ø IF AN$(N)="AC" THEN AN$(N)="ACCOUNTING AND LEGAL"
137Ø IF AN$(N)="WA" THEN AN$(N)="WAGES"
138Ø IF AN$(N)="WT" THEN AN$(N)="WAGE TAXES"
139Ø IF AN$(N)="OS" THEN AN$(N)="OFFICERS SALARIES"
14ØØ IF AN$(N)="LA" THEN AN$(N)="LAUNDRY SUPPLIES"
141Ø IF AN$(N)="HL" THEN AN$(N)="HEAT AND LIGHT"
142Ø IF AN$(N)="TL" THEN AN$(N)="TELEPHONE"
143Ø IF AN$(N)="GT" THEN AN$(N)="GENERAL TAXES"
144Ø IF AN$(N)="INS" THEN AN$(N)="INSURANCE"
145Ø IF AN$(N)="CM" THEN AN$(N)="CLEANING & MAINTENANCE"
146Ø IF AN$(N)="AU" THEN AN$(N)="AUTO"
147Ø IF AN$(N)="SE" THEN AN$(N)="SALES EXPENSE"
148Ø IF AN$(N)="AD" THEN AN$(N)="ADVERTISING"
149Ø IF AN$(N)="OF" THEN AN$(N)="OFFICE"
15ØØ IF AN$(N)="DS" THEN AN$(N)="DUES & SUBSCRIPTIONS"
151Ø IF AN$(N)="INT" THEN AN$(N)="INTEREST"
152Ø IF AN$(N)="DEP" THEN AN$(N)="DEPRECIATION"
153Ø RETURN
154Ø REM **** LPRINTS THE SHORTHAND CODE FOR THE USER ****
155Ø LPRINT"SHORTHAND LIST"
156Ø LPRINT""
157Ø LPRINT"PUR = PURCHASES"
158Ø LPRINT"WA  = WAGES"
159Ø LPRINT"WT  = WAGE TAXES"
16ØØ LPRINT"OS  = OFFICERS SALARIES"
161Ø LPRINT"LA  = LAUNDRY"
162Ø LPRINT"HL  = HEAT AND LIGHT"
163Ø LPRINT"TL  = TELEPHONE"
164Ø LPRINT"GT  = GENERAL TAXES"
165Ø LPRINT"INS = INSURANCE"
166Ø LPRINT"CM  = CLEANING & MAINTENANCE"
167Ø LPRINT"AC  = ACCOUNTING AND LEGAL"
168Ø LPRINT"AU  = AUTO"
169Ø LPRINT"SE  =SALES EXPENSE"
17ØØ LPRINT"AD  =ADVERTISING"
171Ø LPRINT"OF  =OFFICE"
172Ø LPRINT"DS  =DUES & SUBSCRIPTIONS"
173Ø LPRINT"INT = INTEREST"
174Ø LPRINT"DEP = DEPRECIATION"
175Ø RETURN
```

Richard Eidmann
4244 M Street
Philadelphia, PA 19124

■

continued from page 18

```
138Ø R(6) = R(I)/12 : Y(6) = Y(I) * 12
14ØØ R(7) = (1 + R(6))^Y(6)  : C(I) =(1-1/R(7))/R(6)
142Ø S(I) = M(I)/C(I) : T(I) = (S(I)*Y(6))-M(I)
144Ø RETURN
146Ø REM COMPARES MORTGAGES
148Ø T = ABS(T(3)-(T(1)+T(2)))
15ØØ M = ABS(M(3)-(M(1)+M(2)))
152Ø RETURN
```

Dan L. Ward
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■

NEW !!

SUPER UTILITY PLUS

— OVERVIEW —

Copyright ©1981 Breeze Computing, Inc.

SUPER UTILITY PLUS was written by Kim Watt of Breeze Computing, Inc. and is the most powerful program of its kind on the market at this time. This program is a machine language, stand alone program that has its own I/O routines, does not use any ROM or DOS calls, and works on SINGLE or DOUBLE DENSITY systems. SUPER UTILITY PLUS performs such a wide range of varied tasks, that it may truly be called "The King of Utilities". It is not required that the disk be in any drive after initialization of the program and user may custom configure the program to suit his individual system requirements.

ZAP does everything your present "zapping" utility does plus many additional enhancements. It will operate on SINGLE or DOUBLE DENSITY systems and will work with most major operating systems that are presently on the market. It has dual cursors(one for ASCII and one for HEX side of the readout) and allows the user to go to the heart of the disk and read and/or modify data in HEX, ASCII, DECIMAL, BINARY, or OCTAL, regardless of whether it is a standard disk or not. The screen printout on Zap displays one sector at a time in HEX and ASCII (as other "zapping" utilities), but also tells user the true and relative track and whether the disk is IBM format or not. Zap also has a search routine that will locate the highest or lowest configured track on the disk and others that will search the disk for a byte list, ASCII string, word list, or even encripted code. Zap also allows you to display disk sectors, compare disk sectors, copy sector data, zero disk sectors, copy disk sectors, reverse sector data, sector searches, read ID address marks, or alter data address marks.

PURGE has a full screen editing kill control that allows you to kill files by positioning cursor and pressing one key. Also, Purge has several sub-utilities that allow you to zero out unused directory entries or zero out unused disk granules. In addition, user may kill files by naming the common category of the files (Example: /CMD /BAS /TXT <I>nvisible, <V>isible, etc. or even kill files that begin with a specified letter), and also may compute existing passwords, change the disk name, date, passwords, auto command, or even file parameters (name, passwords, protection levels). Lastly, Purge contains a complete disk directory that indicates all active and non-active files on the disk.

FORMAT is a utility that allows the user to format a disk with; standard format, format without erasing existing data, special format (custom format your disk most any way you want it), build a format track and optionally write it back to any track on your disk, and even contains a software bulk erase utility. The total formatting capabilities of this program are just about UNLIMITED and you may even reformat over a disk or add tracks to an existing disk without destroying existing disk data.

DISK COPY will copy most any standard disk, with or without formatting. The Special Disk Copy enables the user to make a backup of most TRS-80® readable disks that are presently on the market, regardless of any efforts that have been made to protect them from being "backed up". (NOTE: This program WILL NOT copy itself). This program's only intended use is for you to make backups of your legally purchased programs. Please DO NOT use this utility to make "bootleg copies" for others as authors of quality programs deserve their royalities.

TAPE COPY enables the user to perform a wide variety of actions that include the ability to read, write, or verify tapes and even includes a Bit by Bit copying routine that will back up most ANY TRS-80® readable tape regardless of protection attempts made by authors. This utility also is for your own use only.

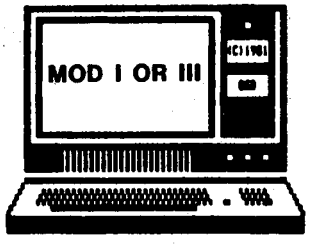
DISK REPAIR allows you to automatically repair the HIT and GAT sectors, and will automatically repair a Boot. This utility also does a complete Directory Check and will advise you of errors that exist. In addition, this utility allows the user to recover killed files (if the file was killed by this utility or by NEWDOS), read protect or un-read protect the directory, move it to a different location on the disk, or clear unused entries. Lastly, this utility advises you of all inactive files that are on the disk.

MEMORY supplies the ability to display, move, test, compare, zero, exchange, input or output a byte to any port, exchange, jump to, reverse, fill, string search, or even load/write and entire track or sectors to/from memory.

FILE contains the abilities to display file sectors, compare files, copy files, disk directory, free space, file locations, drive status, create files, and clear files from disk. These utilities give you a wide range of powerful commands at your disposal to perform just about any function that you want with files up and including the complete reorganization of your entire disk with all the files re-written in their most contigious order.

CONFIGURE SYSTEM gives you the ability to custom configure Super Utility Plus to your system. You may select single or double density, in any combination, 5" drives, select your operating system boot of your choice, upper or lower case, high speed clock, single or double headed drives, or even configure your printer.

To order Super Utility Plus, *send check or money order for $74.95, plus $2.50 shipping and handling to:



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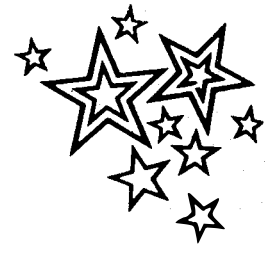

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WINDCRAB, HORSEPOWER, and PERMUTE

Gordon Speer

WINDCRAB

Before a pilot leaves on a cross-country flight, he must calculate the effect the wind will have on his speed and direction. The data that he puts into the calculation are the wind direction and velocity, the airspeed of the plane, and the direction he wants to go which is called the bearing. Directions are measured in degrees, clockwise from north. East is 90 degrees, south is 180, west is 270, and north is 360. The wind direction and velocity are supplied by the weather service in a four-numeral code. The first two numerals are the direction in degrees from which the wind is coming, minus the last digit. The last two numerals are the wind speed in knots, or nautical miles per hour. For example, a wind of 2235 is from 220 degrees at a speed of 35 knots. The airspeed of the plane is also measured in knots. Typical airspeeds range from 100 to 160 knots for light planes, up to 600 knots for commercial jets.

From this calculation a pilot obtains the groundspeed and the angle he must crab (fly sideways) into the wind to stay on course. Crab angles are generally on the order of a few degrees. An angle of over ten degrees indicates the presence of strong cross winds. Murphy's law applies here, of course. "The more you are behind schedule, the stronger will be your headwind."

```
100 'WINDCRAB
110 CLS
120 CLEAR 1000
130 LET PI=3.14159
140 PRINT : PRINT," W  I  N  D  C  R  A  B"
150 PRINT
160 INPUT "        WIND DIRECTION AND VELOCITY (2015)";W
170 IF W > 3699 THEN 160
180 LET WD=10*INT(W/100)        'WIND DIRECTION (FROM), DEGREES
190 LET WV=W-10*WD              'WIND VELOCITY, KNOTS
200 LET WD=WD+180               'WIND DIRECTION (TO), DEGREES
210 INPUT "        BEARING (DIRECTION OF FLIGHT, DEG)";B
220 INPUT "             YOUR CRUISING AIRSPEED, KNOTS";A
230 IF A < 2*WV THEN 220        'INSUFFICIENT AIRSPEED
240 LET WA=ABS(B-WD)            'WIND/BEARING ANGLE
250 IF WA < =180 THEN 280
260 LET WD=WD-360
270 GOTO 240
280 LET SC=WV*SIN(WA*PI/180)/A 'SINE OF CRAB ANGLE
290 LET CA=ATN(SC/SQR(1-SC↑2)) 'SINE OF THE CRAB ANGLE
300 LET CA=CA*180/PI            'CRAB ANGLE IN DEGREES
310 LET GS=SQR(WV↑2+A↑2-2*WV*A*COS((180-WA-CA)*PI/180))
'GROUND SPEED
320 PRINT
330 PRINT STRING$(60,"=")
340 PRINT
350 PRINT USING"            CRAB ANGLE  = ###.# DEGREES";CA
360 PRINT USING"            GROUNDSPEED = ###.# KNOTS";GS
370 PRINT USING"            GROUNDSPEED = ###.# MILES PER
HOUR";GS*1.15
380 PRINT : PRINT
```

HORSEPOWER

Have you ever wondered how they figure out the horsepower of a gasoline engine? I ran across the formula in some old notes and tried it out with the specifications listed for a 1968 Volkswagen Beetle just to see if it was anywhere near the 53 HP listed in the manual. I could tell you how close it came out, but why spoil all the fun you are going to have finding out for yourself.

The formula is PLANK/33000. P is the pressure, that is the air pressure in PSI times the compression ratio. L is the length of the stroke in feet. A is the area of the top of the piston in square inches. N is the number of cylinders. K is the constant which represents the number of revolutions per minute, divided by the number of revolutions per power stroke in each cylinder (1 for two stroke engines, 2 for four stroke engines). The denominator of the equation, 33000, is the number of foot pounds per minute in one horsepower.

If you like history, my hometown of Sterling, IL claims to be the birthplace of the two-stroke-cycle gasoline engine, invented by John Charter back in the 1870's, and manufactured by Fairbanks-Morse in Beloit, WI.

```
100 'HORSEPOWER
110 CLS
120 CLEAR 1000
130 PRINT," H  O  R  S  E  P  O  W  E  R"
140 PRINT
150 INPUT "PISTON OR JET";E$
160 IF E$="JET" THEN 320
170 INPUT "AIR PRESSURE, P.S.I. (14.7)";P
180 INPUT "COMPRESSION RATIO    (7.50)";C
190 INPUT "NUMBER OF CYLINDERS     (4)";N
200 INPUT "BORE IN INCHES       (3.27)";B
210 LET A=3.14*B/2*B/2          'AREA OF PISTON TOP
220 INPUT "STROKE IN INCHES     (2.72)";S
230 LET S=S/12                  'STROKE IN FEET
240 INPUT "REVOLUTIONS PER MIN  (4200)";R
250 INPUT "STROKES PER CYCLE       (4)";K
260 LET K=K/2                   'REVOLUTIONS PER POWER STROKE
```

continued on page 26

Ask about our new form letter program!

Provide your customers with a printed calendar (along with standard banker's holidays) of any month of any year...Useful in motivating history students. Holds the same fascination for students as a game. Tape only for Model I or III.

CALENDAR $9.95

Same features as Calendar. Additionally prints out large "graphics" type wall calendars with memos under each day. Use as a planning calendar with optional disk storage...requires 16K and printer.

SUPER CALENDAR

(tape only) $19.95

MAIL LIST SYSTEM (disk only) $69.95

Our easy-to-use system will accomodate almost any "custom" requirement of even your most demanding clients. A glance below will show that we are far ahead of any other system in speed, variety of features, and sheer volume of names handled...but don't let that fool you. This system can be used just as easily on one disk for a small Christmas card list.

- Maintain virtually an infinite number of disks all in continuous alph. or zip order...essential for large lists.
- Sort **2320** entries (2 full 40 track double density disks) in only 32K or an incredible **4640** entries (2 full 80 track double density disks) in only 48K!...Made possible with our unique date compression techniques on the Model III.
- Super fast sort by alph. or zip order (8 sec. for 1000 entries)...both orders can exist simultaneously on disk.
- High speed recovery of entries from disk...speed of sort is meaningless if retreival from disk is slow...ours pulls in over 11 per sec!
- Transfers old files over to our system.
- In zip order all entries with same zip code are also arranged alphabetically.
- Four digit zips have a leading "O" appended on labels.
- Backup data disks are easily updated as entries are created, edited, or sorted...extremely useful!!
- Optional reversal of name about comma for that non-computer, personalized look.
- Master printouts of your list in several formats (not just a rehash of the labels). Optionally continuous or page oriented...Your customers will want this!
- All Ø's in address labels are replaced by easier to read 0's.
- All labels optionally support an "Attn:" line.
- Many user defined fields with plenty of options for **simultaneous** purging and selecting...even allows for inequalities...powerful and easy to use!!
- Continuous display of how many addresses printed.
- Each disk entry automatically "remembers" how many mailings have been made for that particular entry...Can be tied in with purge/select.
- Primarily written in BASIC for easy modification... embedded machine code for those speed sensitive areas.
- Editing is simple and fast...automatic search.
- Optional 9 digit zip.
- Deleted entries have "holes" on disk filled automatically ...and alph. order is still maintained!
- Test label printing lets you make horizontal and vertical adjustments with ease.
- Optional "one time" mailing for some selected entries.
- Extensive use of error traps (both operator and machine induced)...even recovers from a power failure during a printout!...recycling on disk errors.
- Patch program allows you to upgrade the system to any DOS.
- Documentation manual available separately for $3.95.
- Hardware requirements: 32K printer, and 1 or 2 drives.

Football Scouting Report (Disk only) $89.95

How many high schools and colleges are there within a 75 mile radius of you? Did you know that each is a potential customer at the rate of from $500-$1000 per season? Many already subscribe to more expensive (but inferior) computer analysis services of their scouting reports. Using such a service a coach will typically have an opponent scouted several times prior to actually playing them...This series of programs was written to the specifications of a coach with two state championships to his credit. As a result, the emphasis is on producing statistics that will help in predicting what the opponent will do in a given situation...This is a sophisticated set of programs fully equivalent to that used by professional football teams...Hardware requirements...32K, 1 disk driver and printer.

TRY OUR ONE DAY PC BOARD SERVICE

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Loan amortization schedules are a must for banks, S & L institutions, and accounting firms. You will be able to charge $5 plus per schedule. Multiply that times the number of all loans your clients make per day...easiest money we know of!...runs in about 2 minutes and achieves pin point accuracy with a built in calendar...This sophisticated program produces an exceptionally professional looking printout.

FAST SORT

(handles multiple dim. arrays)

and

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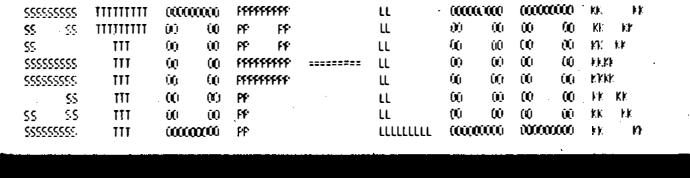
Interfaces to your own basic programs...sort with the speed of machine code but with the convenience of basic. You don't have to know assembly language programming to use these programs. Just use your disk to merge our short basic programs (with embedded machine code) with your own basic program. Follow our simple instructions to poke several values before making the user call from basic. The pokes will set up a sort of string, integer, single, or double precision arrays. Also ascending or descending order is controlled by a single poke. Use one of two programs to sort arrays of the form A(1) or A(Q(1))...The disk includes 8 simple basic programs that are ready to merge with the main sort programs. Use them for learning and evaluation...Also included is a ready to use basic program (already merged with the ORDER program). Use it to obtain a printout of alphabetized names. This program alone is worth $19.95.

Sample Sort Times

8 sec. for 1000 dbl. prec. numbers...50 sec. for 5000 integers. (Ours is one of the only alphabetizers that both ignores non alph. characters and treats upper and lower case alike.)

Sign (Tape only) $9.95

Produce large (reduced 50% here) attention getting signs with your printer...supports most keyboard characters...will print multiple lines...use alone or interface to your own BASIC program...requires just over 16K and a printer.



continued from page 24

```
270 PRINT
280 PRINT USING "#####.# HORSEPOWER";P *C *S *A *N *R /K /33000
290 REM ONE HORSEPOWER = 33000 FOOT POUNDS OF WORK PER MINUTE
300 PRINT
310 END
320 INPUT "THRUST IN POUNDS     (1000)";T
330 INPUT "SPEED IN KNOTS       ( 650)";S
340 PRINT USING "#####.# HORSEPOWER";T*S/325
350 PRINT
```

PERMUTE

The common Yale tumbler lock is a good example of permutation. It has from 5 to 7 pins which are of different lengths and are lifted by a key so that they no longer block the rotation of the tumbler. The number stamped on the key is sometimes the combination of pin lengths and is only one of many such possible combinations for a given lock design. This program prints all possible key numbers if you give it the number of pins (maximum 7) and the number of possible pin lengths (maximum 9). It also tells how much time will be required to display all the combinations, so you can decide whether to stay for the entire performance.

```
100 'PERMUTE
110 DEFINT A-Z
120 DEFDBL N,S
130 CLS
140 PRINT,"   P E R M U T E"
150 PRINT
160 INPUT "NUMBER OF PINS";P
170 IF P > 7 THEN 160          'ERROR TRAP
180 INPUT "NUMBER OF PIN LENGTHS";L
190 IF L > 9 THEN 180          'ERROR TRAP
200 PRINT "THERE ARE"L↑P"PERMUTATIONS OF"L"LENGTHS,"P"PINS
AT A TIME"
210 LET S=INT(L↑P/10+.5)           'SECONDS
REQUIRED TO LIST THEM
220 IF S > 60 THEN 240
230 PRINT "LISTING WILL REQUIRE"S"SECONDS" : GOTO 290
240 LET M=S/60                 'MINUTES REQUIRED TO LIST THEM
250 IF M > 60 THEN 270
260 PRINT "LISTING THEM WILL REQUIRE"M"MINUTES":GOTO 290
270 LET HR=M/60                'HOURS REQUIRED TO LIST THEM
280 PRINT "LISTING THEM WILL REQUIRE"HR"HOURS"
290 ON P GOTO 360  ,350  ,340  ,330  ,320  ,310  ,300
300 FOR A=1 TO L
310 FOR B=1 TO L
320 FOR C=1 TO L
330 FOR D=1 TO L
340 FOR E=1 TO L
350 FOR F=1 TO L
360 FOR G=1 TO L
370 LET N=1000000*A +100000*B +10000*C +1000*D +100*E +10*F +G
380 PRINT N;
390 LET H=H+P+2                'HORIZONTAL POSITION
400 IF H < 56 THEN 430
410 PRINT
420 LET H=0
430 NEXT G
440 IF P=1 THEN 560
450 NEXT F
460 IF P=2 THEN 560
470 NEXT E
480 IF P=3 THEN 560
490 NEXT D
500 IF P=4 THEN 560
510 NEXT C
520 IF P=5 THEN 560
530 NEXT B
540 IF P=6 THEN 560
550 NEXT A
560 END
```

CORRECTION

A program error has been brought to my attention. The bubble-sort method used in CITYSORT (issue #37, August 1981, page 23) has an incorrect FOR-NEXT loop in line 270. This line should read as follows:

270 FOR I=N-1 TO 1 STEP -1

Otherwise the program will not sort the end of the list. Sorry about that!

Gordon Speer
3304 Woodlawn Road
Sterling, IL 61081
(815) 625-5251

■

---

continued from page 16

```
780 LPRINT " "
790 LPRINT "TITLE: ";T$;"  DATE: ";D$
800 LPRINT "PREPARED BY: ";O$
810 FOR I=1 TO 4: LPRINT " ": NEXT
820 FOR R=0 TO 15: A=15360+R*64: FOR C=1 TO 63
830 B=A+C:D=PEEK(B)
840 IF D>=129 AND D<=191 THEN LPRINT "*"; ELSE LPRINT CHR$(D);
850 NEXT C: LPRINT CHR$(10): IF F$="Y" THEN LPRINT " "
860 NEXT R
870 GOTO 870
```

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College of Business
University of South Alabama
Mobile, Alabama 36688

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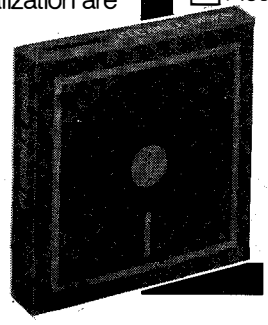

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CHAINER

Jay R. Newirth

One of the nice features of NEWDOS/80 is the CHAIN command. However, the NEWDOS/80 manual doesn't do a great job of explaining how to use it - thus, the creation of CHAINER. This program allows one to create, edit (change, delete, or insert), save, and load in a chain file for execution by the NEWDOS/80 disk operating system. The program is 90% self documenting, but some important information is provided below.

First, one must know how the CHAIN command is used in NEWDOS/80. The format for a chain function is:

CHAIN,FILESPEC,SECTION . . . or

CHAIN FILESPEC SECTION (i.e., the commas are optional).

FILESPEC is any eight character name (following guidelines for FILESPECs). The FILESPEC must include the extenson "/JCL"! The program will supply this extension if one is not given. Although the "/JCL" extension is mandatory, it is not required when the CHAIN command is executed. Thus, the following examples are acceptable:

CHAIN STARTUP/JCL or

CHAIN STARTUP

Either of these two commands will work, as long as a file entitled STARTUP/JCL exists on the disk!

SECTION tells the CHAIN command to start the CHAIN function with the portion of FILESPEC that is named SECTION.... As an example,

CHAIN STARTUP/JCL SECTIONA

tells the DOS to start the CHAIN routine at the portion of STARTUP/JCL that is labeled SECTIONA. By specifying SECTION, on can create a single large master CHAIN file, naming specific portions via the section command (using CHAINER) and then executing only that particular portion of the CHAIN file. This saves you from writing many small CHAIN files.

USING THE CHAINER PROGRAM

(1) CREATE/ADD TO FILE: You will be prompted for a FILENAME (CHAIN/JCL is the default) and the drive to save the file on. If you forget the "/JCL' extension it will be added automatically. With each entry for the CHAIN file, you have six options to choose from:

1: Command is to be displayed on video during chaining.

2: Command is to pause chaining and print any message you type.

3: Command is to define section name (see discussion above).

4: Command is simply a remark statement and has no function in the chaining program.

5: Command is any normal DOS or Level II command to be executed by the CHAIN command.

6: Exits create/add mode.

(2) EDIT FILE: This mode is self-explanatory. You can change, delete, or insert command lines. In the delete mode, you may answer "ENDING LINE" with "ENTER" for a default response of "1". The same holds true for the insert mode.

(3) LIST FILE: You can list the file on the video display or line printer. The graphic codes you see are used by the CHAIN command. They are there purposely. Be sure that the line printer is ready before printing.

(4) SAVE FILE: saves file to disk, and writes the needed code used by NEWDOS/80 to run the CHAIN file.

(5) LOAD FILE: loads a file from the disk into memory. If "/JCL" extension is omitted, it will be added automatically.

Here is an example CHAIN file you may want to create and run to see how the CHAIN command works:

Entry #1: choose option 1, type: CHAIN PROGRAM FOR TRS-80 MODEL I.

Entry #2: choose option 2, type: PRESS <ENTER> when ready to continue.

Entry #3: choose option 4, type: THE FOLLOWING 5 ITEMS ARE DOS/LEVEL II COMMANDS.

Entry #4: choose, option 5, type: DIR

Entry #5: choose, option 5, type: FREE

Entry #6: choose, option 5, type: LIB

Entry #7: choose, option 5, type: CLOCK ON

Entry #8: choose, option 5, type: BASIC LOAD "CHAINER"

Entry #9: choose, option 6 (exit).

Save this file using function (4) above. Do a CMD"S", then type "CHAIN,FILESPEC" where FILESPEC is the name you used to create the above program. Then sit back and watch!

```
10 ' ******************************************
20 ' **                                      **
30 ' **                                      **
40 ' **          CHAIN FILE BUILDER          **
50 ' **           FOR NEWDOS/80 tm           **
60 ' **                                      **
70 ' **      Written by - Jay R. Newirth     **
80 ' **             (C)  1981                **
90 ' **                                      **
100 '**                                      **
110 '******************************************
```

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```
12Ø CLEAR 1ØØØØ
13Ø DEFINT A-Z
14Ø DIM A$(1ØØ)
15Ø DIM B$(1ØØ)
16Ø LC=1
17Ø DEF FN T$=STRING$(64, 61)
18Ø CLS
19Ø PRINT TAB(15)"Newdos/8Ø (tm) -- Chain File Builder"
2ØØ PRINT FN T$;
21Ø PRINT"<1> Create/Add to File"
22Ø PRINT"<2> Edit File"
23Ø PRINT"<3> List File"
24Ø PRINT"<4> Save File to Disk"
25Ø PRINT"<5> Load File From Disk"
26Ø PRINT"<6> Return to DOS"
27Ø PRINT"<7> Exit Program"
28Ø IF A$(1)<>"" THEN PRINT @ 96Ø, USING"Current File In
Buffer : %          %   No. Lines = ###";F$; LC;
29Ø PRINT @ 64Ø,"Select Option.... "
3ØØ ON INSTR (" 1234567",INKEY$)GOTO 31Ø, 32Ø, 93Ø, 2Ø7Ø,
248Ø, 263Ø, 289Ø, 338Ø
31Ø GOTO 3ØØ
32Ø IF A$(1)<>"" THEN CLS: PRINT"TEXT IN BUFFER !!!!":
PRINT"<A> dd to Current File": PRINT"<C> lear Text Buffer for
New File": PRINT"<E> xit to Main Menu" ELSE 38Ø
33Ø ON INSTR (" AaCcEe",INKEY$)GOTO 34Ø, 35Ø, 35Ø, 37Ø, 37Ø,
18Ø, 18Ø
34Ø GOTO 33Ø
35Ø LC=LC+1
36Ø GOTO 48Ø
37Ø RUN
38Ø CLS
39Ø PRINT"CREATE FILE"
4ØØ PRINT FN T$;
41Ø LINE INPUT"Name of File (DEFAULT = CHAIN/JCL) ? ";F$
42Ø IF F$="" THEN F$="CHAIN/JCL" ELSE IF RIGHT$(F$, 3)<>"JCL"
THEN F$=F$+"/JCL"
43Ø GOSUB 348Ø
44Ø LINE INPUT"Save File On Drive Ø,1,2,3 (DEFAULT = DRIVE Ø)
? ";DN$
45Ø IF DN$="" THEN DN$="Ø": GOTO 47Ø
46Ø IF (DN$<"Ø" OR DN$>"3") THEN 44Ø
47Ø F$=F$+":" +DN$
48Ø CLS
49Ø PRINT"CREATE FILE : ";F$
5ØØ PRINT FN T$;
51Ø GOSUB 299Ø
52Ø GOSUB 3Ø5Ø
53Ø PRINT STRING$(64, 61);
54Ø FOR T=9 TO 14
55Ø PRINT @ T*64, USING"OPTION ## >> ";LC;
56Ø ON INSTR (" 12345Ee",INKEY$)GOTO 57Ø, 58Ø, 64Ø, 7ØØ, 76Ø,
82Ø, 87Ø, 87Ø
57Ø GOTO 56Ø
58Ø PRINT @ T*64, CHR$(3Ø)"Display  >> ";
59Ø LINE INPUT A$(LC)
6ØØ IF A$(LC)="" THEN 58Ø
61Ø A$(LC)=CHR$(131) + A$(LC)
62Ø B$(LC)="DISPLAY"
63Ø GOTO 89Ø
64Ø PRINT @ T*64, CHR$(3Ø)"Pause    >> ";
65Ø LINE INPUT A$(LC)
66Ø IF A$(LC)="" THEN 64Ø
67Ø A$(LC)=CHR$(129) +A$(LC)
68Ø B$(LC)="PAUSE"
69Ø GOTO 89Ø
7ØØ PRINT @ T*64, CHR$(3Ø)"Sect.ID  >> ";
71Ø LINE INPUT A$(LC)
72Ø IF A$(LC)="" THEN 7ØØ
73Ø A$(LC)=CHR$(128) +A$(LC)
74Ø B$(LC)="SECT ID"
75Ø GOTO 89Ø
76Ø PRINT @ T*64, CHR$(3Ø)"Remark   >> ";
77Ø LINE INPUT A$(LC)
78Ø IF A$(LC)="" THEN 76Ø
79Ø A$(LC)=CHR$(13Ø) +A$(LC)
8ØØ B$(LC)="REMARK"
81Ø GOTO 89Ø
82Ø PRINT @ T*64, CHR$(3Ø)"Command  >> ";
83Ø LINE INPUT A$(LC)
84Ø IF A$(LC)="" THEN 82Ø
85Ø B$(LC)="COMMAND"
86Ø GOTO 89Ø
87Ø LC=LC-1
88Ø GOTO 18Ø
89Ø LC=LC+1
9ØØ NEXT
91Ø PRINT @ 576, CHR$(31)
92Ø GOTO 54Ø
93Ø IF A$(1)="" GOSUB 344Ø
94Ø N1=Ø
95Ø N2=Ø
96Ø NC=Ø
97Ø CLS
98Ø PRINT"EDIT CHAIN FILE : ";F$
99Ø PRINT @ 4Ø,"# LINES =";LC
1ØØØ PRINT FN T$;
1Ø1Ø PRINT"<1> Change Text Line(s)"
1Ø2Ø PRINT"<2> Delete Text Line(s)"
1Ø3Ø PRINT"<3> Insert Text Line(s)"
1Ø4Ø PRINT"<4> Return to Main Menu"
1Ø5Ø PRINT
1Ø6Ø PRINT"Select Option ... "
1Ø7Ø ON INSTR (" 1234",INKEY$)GOTO 1Ø8Ø, 1Ø9Ø, 128Ø, 161Ø,
18Ø
1Ø8Ø GOTO 1Ø7Ø
1Ø9Ø PRINT @ 128, CHR$(31)"";
11ØØ GOSUB 299Ø
111Ø PRINT FN T$;
112Ø G$=""
113Ø PRINT @ 512, CHR$(31)USING"Enter Line No. To Change
(1 - ##) or <ENTER> To Exit > ";LC;
114Ø LINE INPUT G$
115Ø IF G$="" THEN 97Ø
116Ø G=VAL(G$)
117Ø IF(G=Ø OR G>LC)THEN 112Ø
118Ø PRINT @ 512, CHR$(31)"Line";G;"Reads >> ";
119Ø IF ASC(LEFT$(A$(G), 1))>127 THEN PRINT MID$(A$(G), 2)
```

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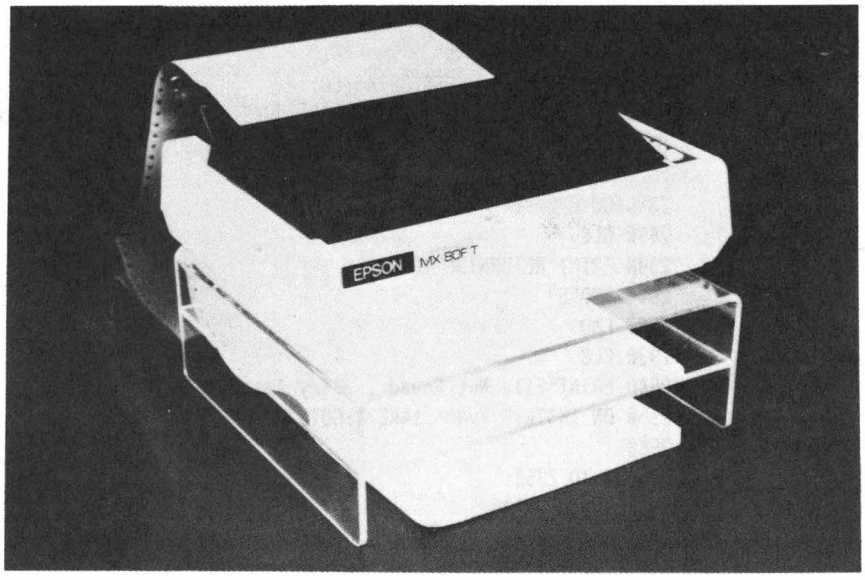
```
ELSE PRINT A$(G)
1200 PRINT @ 640,"REPLACEMENT Option (<ENTER> Cancels) >> "
1210 I$=INKEY$
1220 IF I$="" THEN 1210
1230 IF I$=CHR$(13)THEN 930
1240 GOSUB 3070
1250 PRINT @ 960,"Do Again (Y/N)?";
1260 ON INSTR(" YyNn",INKEY$)GOTO 1270, 1120, 1120, 930, 930
1270 GOTO 1260
1280 N1$=""
1290 N2$=""
1300 CLS
1310 PRINT"DELETE TEXT LINES"
1320 PRINT @ 40,"# LINES =";LC
1330 PRINT FN T$;
1340 PRINT @ 128, CHR$(31)USING"Starting Line ( 1 - ##) or
<ENTER> To Exit > ";LC;
1350 LINE INPUT N1$
1360 IF N1$="" THEN 970
1370 N1=VAL(N1$)
1380 IF N1=LC THEN 1460
1390 IF N1>LC THEN 1340
1400 PRINT @ 192, USING"Ending   Line (## - ##) or <ENTER>
To Exit > ";N1+1; LC;
1410 LINE INPUT N2$
1420 IF N2$="" THEN 970
1430 N2=VAL(N2$)
1440 IF(N2>LC OR N2<N1)THEN 1400
1450 IF(N2=LC AND N1=1)THEN PRINT: PRINT"ENTIRE FILE WILL BE
DELETED !!!"
1460 PRINT @ 960,"Okay To Delete (Y/N) ?";
1470 ON INSTR(" YyNn",INKEY$)GOTO 1480, 1490, 1490, 930, 930
1480 GOTO 1470
1490 IF(N2=LC AND N1=1)THEN 120
1500 FOR A=N1 TO N2
1510 A$(A)=" "
1520 B$(A)=" "
1530 NEXT
1540 NC=1
1550 FOR A=1 TO LC
1560 IF A$(A)<>" " THEN A$(NC)=A$(A): B$(NC)=B$(A): NC=NC+1:
NEXT ELSE NEXT
1570 LC=NC-1
1580 PRINT @ 960,"Deletion Completed ... ";
1590 GOSUB 3410
1600 GOTO 940
1610 N3$=""
1620 N4$=""
1630 CLS
1640 PRINT"INSERT TEXT LINES"
1650 PRINT @ 40,"# LINES =";LC
1660 PRINT FN T$;
1670 GOSUB 2990
1680 PRINT FN T$;
1690 PRINT @ 512, CHR$(31)USING"Start Inserting at Line No.
( 1 - ##) or <ENTER> To Exit > ";LC;
1700 LINE INPUT N3$
1710 IF N3$="" THEN 930
1720 N3=VAL(N3$)
1730 IF N3>LC THEN 1690
1740 PRINT @ 576, CHR$(31)"No. of Insertions To Make (<ENTER>
Defaults to 1) > ";
1750 LINE INPUT N4$
1760 IF N4$="" THEN N4=1 ELSE N4=VAL(N4$)
1770 PRINT"Line(s) will be inserted before this line:"
1780 PRINT
1790 PRINT USING"### %       % ...";N3; B$(N3);
1800 IF ASC(LEFT$(A$(N3), 1))>127 THEN PRINT MID$(A$(N3), 2)
ELSE PRINT A$(N3)
1810 PRINT @ 960,"Okay To Insert (Y/N)?";
1820 ON INSTR(" YyNn",INKEY$)GOTO 1830, 1840, 1840, 940, 940
1830 GOTO 1820
1840 PRINT @ 512, CHR$(31)USING"## Insertion(s) To Be Made
Starting At Line ###";N4; N3
1850 NC=LC+N4
1860 UC=NC
1870 FOR A=LC-N3+1 TO 1 STEP -1
1880 A$(NC)=A$(NC-N4)
1890 B$(NC)=B$(NC-N4)
1900 NC=NC-1
1910 NEXT
1920 FOR G=N3 TO N3+N4-1
1930 A$(G)=""
1940 B$(G)=""
1950 PRINT @ 640, CHR$(31)"INSERTION #";UN+1;"OPTION ? >>"
1960 I$=INKEY$
1970 IF I$="" THEN 1960
1980 IF I$=CHR$(13)THEN 930
1990 GOSUB 3070
2000 UN=UN+1
2010 NEXT
2020 UN=0
2030 LC=UC
2040 PRINT @ 960,"Insertion Completed ...";
2050 GOSUB 3410
2060 GOTO 940
2070 IF A$(1)="" GOTO 3440
2080 CLS
2090 PRINT"LIST TEXT FILE"
2100 PRINT FN T$;
2110 PRINT"<P> rinted Listing"
2120 PRINT"<V> ideo Listing"
2130 PRINT
2140 PRINT"Select Option ... "
2150 ON INSTR(" VvPp",INKEY$)GOTO 2160, 2170, 2170, 2280,
2280
2160 GOTO 2150
2170 BC=0
2180 CLS
2190 PRINT"FILE LISTING : ";F$
2200 PRINT FN T$;
2210 FOR A=1 TO LC
2220 PRINT USING"### %      % ...";A; B$(A);
2230 IF ASC(LEFT$(A$(A), 1))>127 THEN PRINT MID$(A$(A), 2)
ELSE PRINT A$(A)
2240 BC=BC+1
2250 IF BC=12 THEN 2380
2260 NEXT
```

```
227Ø GOTO 246Ø
228Ø PRINT @ 448,"Ready Printer and Press Any Key"
229Ø IF INKEY$ ="" THEN 229Ø
23ØØ IF PEEK(14312)<>63 THEN 228Ø
231Ø LPRINT"CHAIN FILE NAME ..... ";F$
232Ø LPRINT STRING$(4Ø,"=")
233Ø FOR A=1 TO LC
234Ø LPRINT USING"### %      % ...";LC; B$(A);
235Ø IF ASC(LEFT$(A$(A), 1))>127 THEN LPRINT MID$(A$(A), 2)
ELSE LPRINT A$(A)
236Ø NEXT
237Ø GOTO 18Ø
238Ø IF BC=12 AND A=LC THEN 246Ø
239Ø PRINT @ 96Ø,"PRESS <C> TO CONTINUE    <Q> TO QUIT";
24ØØ I$=INKEY$
241Ø IF I$="" THEN 24ØØ
242Ø IF I$="C" THEN 244Ø
243Ø IF I$="Q" THEN 18Ø ELSE 24ØØ
244Ø PRINT @ 128, CHR$(31)"";
245Ø GOTO 226Ø
246Ø PRINT @ 96Ø,"PRESS ANY KEY FOR MAIN MENU";
247Ø IF INKEY$ ="" THEN 247Ø ELSE 18Ø
248Ø IF A$(1)="" GOTO 344Ø
249Ø CLS
25ØØ PRINT"SAVING FILE TO DISK : ";F$
251Ø PRINT FN T$;
252Ø PRINT"Insert disk in drive ";DN$;" and press <ENTER>"
253Ø IF INKEY$ <>CHR$(13)THEN 253Ø
254Ø OPEN"O",1, F$
255Ø FOR A=1 TO LC
256Ø PRINT#1, A$(A)
257Ø PRINT @ 576, CHR$(3Ø)A$(A)
258Ø NEXT A
259Ø PRINT @ 576, CHR$(3Ø)"PROGRAM SAVED ON DISK..."
26ØØ CLOSE
261Ø GOSUB 341Ø
262Ø GOTO 18Ø
263Ø IF A$(1)<>"" THEN CLS: PRINT"TEXT IN BUFFER...WISH TO
CLEAR (Y/N)???" ELSE 27ØØ
264Ø ON INSTR(" YyNn",INKEY$)GOTO 265Ø, 266Ø, 266Ø, 18Ø, 18Ø
265Ø GOTO 264Ø
266Ø CLEAR 1ØØØØ
267Ø DIM A$(1ØØ), B$(1ØØ)
268Ø LC=1
269Ø DEF FN T$=STRING$(64, 61)
27ØØ ON ERROR GOTO 293Ø
271Ø CLS
272Ø PRINT"LOADING FILE FROM DISK"
273Ø PRINT STRING$(64,"=");
274Ø LINE INPUT"Enter Filename Please > ";F$
275Ø IF RIGHT$(F$, 3)<>"JCL" THEN F$=F$+"/JCL"
276Ø GOSUB 348Ø
277Ø ON ERROR GOTO 293Ø
278Ø OPEN"I",1, F$
279Ø LINE INPUT#1, A$(LC)
28ØØ IF ASC(LEFT$(A$(LC), 1))=131 B$(LC)="DISPLAY": GOTO 285Ø
281Ø IF ASC(LEFT$(A$(LC), 1))=129 B$(LC)="PAUSE": GOTO 285Ø
282Ø IF ASC(LEFT$(A$(LC), 1))=128 B$(LC)="SECT ID": GOTO 285Ø
283Ø IF ASC(LEFT$(A$(LC), 1))=13Ø B$(LC)="REMARK": GOTO 285Ø
284Ø B$(LC)="COMMAND"
285Ø PRINT @ 576, CHR$(3Ø)A$(LC)
286Ø IF EOF(1)CLOSE: PRINT @ 576, CHR$(3Ø)"PROGRAM READ INTO
BUFFER...": GOSUB 341Ø : ON ERROR GOTO Ø: GOTO 18Ø
287Ø LC=LC+1
288Ø GOTO 279Ø
289Ø CLS
29ØØ PRINT"RETURNING TO DOS"
291Ø CMD"S"
292Ø END
293Ø CLS
294Ø PRINT"File Not Found ... Try Again (Y/N)?"
295Ø ON INSTR(" YyNn",INKEY$)GOTO 296Ø, 297Ø, 297Ø, 298Ø,
298Ø
296Ø GOTO 295Ø
297Ø RESUME 27ØØ
298Ø RESUME 18Ø
299Ø PRINT TAB(15)"OPTION <1> - Display a Message"
3ØØØ PRINT TAB(15)"OPTION <2> - Chain Pause / Display
Message"
3Ø1Ø PRINT TAB(15)"OPTION <3> - Section Identifier"
3Ø2Ø PRINT TAB(15)"OPTION <4> - Remark or Comment Line"
3Ø3Ø PRINT TAB(15)"OPTION <5> - DOS/LEVEL II Command"
3Ø4Ø RETURN
3Ø5Ø PRINT TAB(15)"OPTION <E> - Exit This Mode"
3Ø6Ø RETURN
3Ø7Ø ON INSTR (" 12345",I$) GOTO 3Ø8Ø, 3Ø9Ø, 315Ø, 321Ø,
327Ø, 333Ø
3Ø8Ø GOTO 3Ø7Ø
3Ø9Ø PRINT @ 64Ø, CHR$(3Ø)"Display  >> ";
31ØØ LINE INPUT A$(G)
311Ø IF A$(G)="" THEN 3Ø9Ø
312Ø A$(G)=CHR$(131) +A$(G)
313Ø B$(G)="DISPLAY"
314Ø RETURN
315Ø PRINT @ 64Ø, CHR$(3Ø)"Pause    >> ";
316Ø LINE INPUT A$(G)
317Ø IF A$(G)="" THEN 315Ø
318Ø A$(G)=CHR$(129) +A$(G)
319Ø B$(G)="PAUSE"
32ØØ RETURN
321Ø PRINT @ 64Ø, CHR$(3Ø)"Sect.ID  >>";
322Ø LINE INPUT A$(G)
323Ø IF A$(G)="" THEN 321Ø
324Ø A$(G)=CHR$(128) +A$(G)
325Ø B$(G)="SECT ID"
326Ø RETURN
327Ø PRINT @ 64Ø, CHR$(3Ø)"Remark   >> ";
328Ø LINE INPUT A$(G)
329Ø IF A$(G)="" THEN 327Ø
33ØØ A$(G)=CHR$(13Ø) +A$(G)
331Ø B$(G)="REMARK"
332Ø RETURN
333Ø PRINT @ 64Ø, CHR$(3Ø)"Command  >> ";
334Ø LINE INPUT A$(G)
335Ø IF A$(G)="" THEN 333Ø
336Ø B$(G)="COMMAND"
```

continued on page 55



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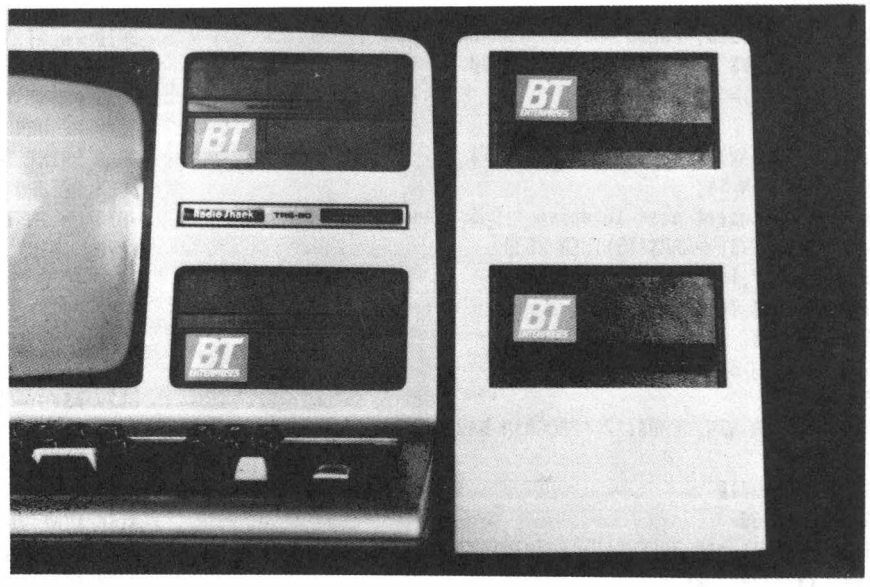

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Color Computer Corner

Joseph Rosenman

This Month: Screen Displays

When evaluating the limitations and potentials of a computer system, attention must be paid to both the hardware and the software. The obvious side of the hardware evaluation includes such information as: how much memory, what kind of mass storage (cassette, floppy disk, hard disk, etc.), processor speed (1 MHz, 2 MHz, etc.), and of course, type of processor. There are many additional questions that could be asked. The correct matching of the hardware abilities with the "computing application" can often prove to be of critical importance. Most Personal Computers (such as the TRS-80 line) allow a large measure of flexibility in the type of hardware used in the construction of the system. One reason this is so lies in the power of the software included with the system. If you put the Model 1 and Color Computer next to each other for comparision, there are only two significant similarities: they both are manufactured by Radio Shack, and they both include Microsoft Basic.

Are all BASICs alike? Unfortunately (or fortunately), no. BASIC is an acronym for Beginners All Purpose Symbolic Instruction Code. This language was invented (I believe) sometime in the 1960s by Dr. John Kemeny at Dartmouth College. BASIC is an "interpretive" language (as opposed to compiled, assembled, or translated languages). This means that every time a statement (whether entered directly or via program execution) is encountered, it must be interpreted. In a compiled language (such as FORTRAN or PASCAL), the statements are examined and converted into machine code (remember, computers ONLY understand machine code). When running compiled languages, there are always at least two steps involved in the "running" of the program. First, the "source" program must be compiled into an "object" module. Then, the object module must be executed. (Often, there is a middle step where the object module has to be "loaded" into a specific memory configuration. The result of a load, or link-load if several modules are being combined, is known as a "load" module. Thus, a single program might have a source file, an object module, and a load module.)

What is the advantage of such a complicated method of running a program? Speed and flexibility. A Fortran program will run much faster than a Basic program. When the Basic interpreter examines a line of code, it takes as much time to "understand" what the line means whether it is the first time or the one thousandth time that the line is executed! The Basic interpreter is full of separate machine language goodies that understand discrete portions of Basic code. A single line of code might access tens or even hundreds of machine language routines before it is "executed".

So what's so good about Basic? Like everything else, there are advantages and disadvantages in using Basic. Basic is conversational, and therefore easy to use (especially for beginning computer users). Also, each Basic program requires only one file: the source code. Imagine the mess involved in compiling, loading, and executing a Fortran program on a computer without a disk. With Basic, you can easily run with a non-disk system. This means that computer systems built around Basic as the primary software can also be inexpensive (since a disk system is strictly an option).

So what's so bad about Basic? It's very slow. Also, the source code in Basic is entirely un-structured. (The topic of structured programming is far removed from the topic of this column. Structured programming has to do with the way code is organized, and the way and types of data structures allowed. The only structures present in Basic are the IF/THEN/ELSE and the FOR/NEXT structures. Pascal is an example of a highly structured language.)

How is it possible for BASIC to run on both the Model 1 and the Color Computer, when the Model 1 is a Z80-based computer and the Color Computer is a 6809-based computer? It isn't done with mirrors, I can assure you! The BASICs in both computers expect the same kind of input (source code), and produce the same results. The difference lies in the fact that the BASIC in the Model 1 is written in Z80 machine language, while the BASIC in the Color Computer is written in 6809 machine language. BASIC is a machine language program that expects BASIC source code as its input. Consider an analogy: if either a Frenchman or an Englishman are thirsty, they will ask for a glass of water. Even though English and French are different languages (like BASIC or FORTRAN), both requests will get the same results: a drink. If you have two Englishman together, however, one may ask for the drink, while the other might write the request down. Both are in English, and both elicit the same result. The difference lies in the medium. If you view speech and writing as two different types of communication, you will see how the analogy works in the case of two different computers. The problem is that the two Basics are usually not exactly alike. This can either be as a result of physical differences between the computers

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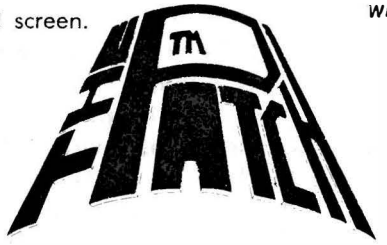

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(hardware differences), or the degree of "completeness" in the particular version of Basic.

There is a tremendous amount of software in Basic which is readily available to the personal computer user. Unfortunately, if the Basic was written for some other computer, there may well be subtle differences between the two versions. Over the next few columns, I will be explaining how to "correct" other BASICs for use on the Color Computer. To begin, my primary source will be the Model 1. The reason for this choice is that *Computronics* includes much Basic software for the Model 1 in the past, and (I believe that) most Color Computer owners who have another computer probably own a Model 1 or Model 3. This month's topic is screen display.

One instruction in Basic is PRINT @. PRINT @ causes printing to occur at a specific screen location. The Color Computer screen is 32 characters across by 16 lines. This means that there are a total of 512 screen locations (numbered from 0 to 511). The Model 1 screen is 64 characters by 16 lines. The total on the Model 1 is 1024 characters (numbered 0 to 1023). In order to convert the PRINT @ value from Model 1 to Color Computer, use the formula Color Computer = INT(Model 1 / 2). Obviously, Model 1 programs that require the use of the entire line will require reformatting. The Model 1 also has a 32 character per line mode. In this mode, only even numbered PRINT @s are valid. In this case, the above formula will work without a hitch.

Another way of getting information onto the screen is to use the POKE function to write the number directly into Video RAM. In the Model 1, Video RAM begins at Hex 3C00 (or decimal 15360). The Color Computer Video Ram begins at Hex 400 (or decimal 1024). In principle, it is possible to transpose values from Model 1 down to color computer, but there are several rules that must be observed:

(1) If the Model 1 POKES are outside of the range of 15360 to 16384, they ARE NOT TO VIDEO RAM. This means that these POKES cannot be adapted to the Color Computer.

(2) For every two positions on the Model 1, combine into 1 position on the color computer.

Observe the following sample of code below:

```
FOR I=15360 TO 15360+512 : POKE I,48 : NEXT I

FOR I=1024 TO 1024+256 : POKE I,48 : NEXT I
```

The first example is for the Model 1, and the second for the Color Computer. They both will fill the top half of the screens with zeros. Consider the case shown below:

```
FOR I=15360 TO 15360+64 : POKE I,48 : NEXT I
FOR J=I TO I+64 : POKE J,49 : NEXT J

FOR I=1024 TO 1024+32 : POKE I,48 : NEXT I
FOR J=I TO I+64 : POKE J,49 : NEXT J
```

Again, the first example is for the Model 1, and the second is for the Color Computer. This code will fill the first line with zeros, and the second lines with ones. One further note: if you are POKEing values above 127, the two computers display graphics differently (see the discussion below). Graphic codes will most likely require modification. The Color Computer also has Video RAM above 1535. This RAM is used for the Extended Graphics. Since there is no corresponding "hardware" function in the Model 1 (or most other computers), there is no code that could be translated into Color Computer Basic.

The last function I will discuss is the SET function. In the Color Computer, each "block" that can be SET or RESET is 2 by 2. This means that there are 64 horizontal by 32 vertical points that can be addressed. In addition, each 2 by 2 block can be one of 8 different colors. The Model 1 uses a 2 by 3 format (but, of course, all one color). Therefore, the Model 1 has 128 horizontal by 48 vertical points that can be addressed. The total points on the Color Computer is 2048, while the Model 1 has 6144. In some cases, these graphic blocks are used to form extremely complex shapes. It will often prove very difficult to translate them in a simple fashion. Understanding the way they work will, however, assist the programmer in re-writing the code for the Color Computer. The SET command on the Model 1 has 2 fields, specifying the vertical and horizontal locations. The Color Computer has a third field indicating the color. The SETs on the Model 1 form the different graphic codes between 128 and 191. The codes between 192 and 255 are space compression codes. 192=0 spaces, 193=1 space, 194=2 spaces, ... 255=63 spaces. On the Color Computer, all the codes from 128 to 255 are reserved for graphic blocks, and there are no space compression characters. You can replace space compression characters by using: STRING$(#-192," ") where # equals the compression code. The Color Computer also has a PSET command. This operates very much like the SET, except that it SETs a block in the graphic RAM rather than in the text RAM. The PSETs have various different resolutions depending on the PMODE in effect. When altering Model 1 SETs into Color Computer SETs, remember to add the third parameter (for color selection).

In general, it is easy to convert the screen output from one computer to another. The greatest problem occurs in cases where the screen size changes (such as Model 1 64 across to Color Computer 32 across). The discussions about PRINT @, POKE, and SET describe the more difficult problems involved in "transporting" code from one computer to another. It is an unfortunate fact that some programs simply cannot be adapted to another machine because they make critical use of functions specific to the machine they were written for. Usually, you will find that a program can easily be adapted to the Color Computer with a small effort in translation.

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PROGRAM PREVIEWS

A. A. Wicks

This Month: Book Review and Program Update

It doesn't seem so very long ago that finding a good text to self-learn BASIC was a rather difficult task. I recall that when my interest in having my own computer began, I was absolutely intrigued by "Instant BASIC" by Jerald R. Brown. Today, there are literally dozens of texts available for those interested in getting into programming with BASIC, either in a modest way, or as a career. This month, we are going to Preview one of these, and also update a recently reviewed program.

Radio Shack has had published under their aegis (Prentice Hall, Inc. printing), "Introduction to TRS-80 Level II BASIC and Computer Programming," written by Dr. Michael P. Zabinski. This rather long-titled book falls into the classification of being for the beginning programmer up to the more sophisticated, who is looking for review and brushing-up on techniques. The text moves into the subject matter quite rapidly; in fact, the first chapter could have probably been omitted without loss, as only a page and a half is devoted to "Getting Started, The Keyboard, and Communicating with the Computer." Clearly, unless the reader has already been through the Level I or Model III manual, this quick initial exposure might be discouraging. But with some previous exposure, getting to the subject matter this quickly will please the impatient.

Similarly, the next chapter moves along at a rapid pace, covering numerical and character information , arithmetic functions, hierarchy of operations, and types of variables. Throughout this chapter, and the complete book for that matter, important points to remember are highlighted by gray screening (a good memory aid), and all examples are shown as they might appear on a dot-matrix printer. In addition, each program line is commented upon, not as REM lines, but as full explanations.

Chapter 3 has the reader writing simple programs, and these are little programs that provide a great deal of satisfaction to the newcomer, such as computing interest. Within this chapter, many of the computer operating functions are slyly worked in; for instance, all

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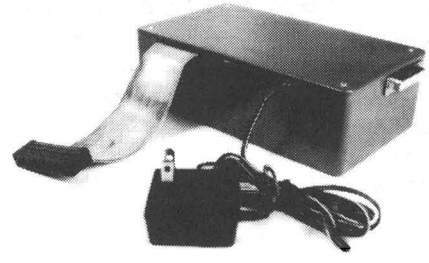

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   d) Receive data only from host,
   e) Send data only to host,
   f) Send data only to terminal,
   g) Operate in dumb terminal mode,
   h) Operate in ST80™ mode,
   i) Check CTS status. (clear to send)

This is a self relocating subroutine that can load anywhere in high memory.

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of the editing functions. The result is rather painless indoctrination. Chapter 4 moves into branching operations, transfer statements and decision-making statements. Flowcharting is described and thoroughly discussed — this is really one of the better discussions of the subject that I have seen. Error functions are covered in similar detail.

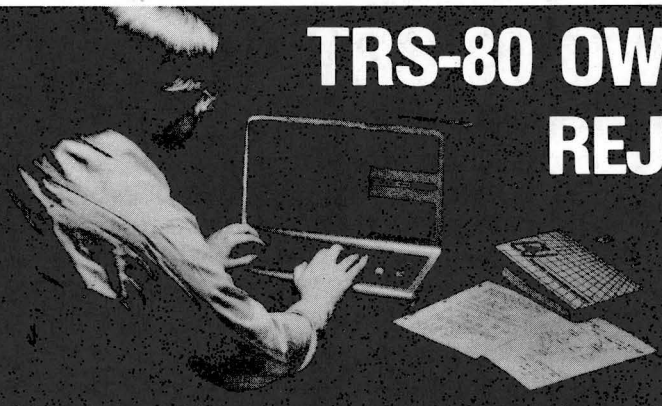
Looping, For-Next, subscripted variables, and error-tracing are discussed in Chapter 5, and Read and Data statements are presented in Chapter 6. The latter subject is presented at considerable length here, with numerous examples and short programs being provided. Anyone having difficulties in understanding this phase of programming will find their problems clarified here, I am sure. This chapter also covers graphing techniques, and includes good explanations of Print Using and Print@. Data storage using cassette recorders is mentioned, but disk storage is not.

All of the Library Functions are very adequately covered in Chapter 7, such as INT, RND, ABS, etc. Chapter 8, in explaining Subroutines, provides several practical example programs such as Blinking Display, and Computer-Aided Instruction. Although graphing was previously discussed, Chapter 9 goes further into the subject of Graphics itself as used in Level II, with eleven pages alone devoted to this material. This detailed information in itself places a high value on the usefulness of this text.

Strings, ASCII codes, string function commands, binary-to-decimal conversion, and INKEY$ are the subjects of Chapter 10, again with many examples supporting the text.

The several Appendixes provide information that may be used frequently for reference — Error Messages, Reserved Words, and an excellent Glossary of Level II and other BASIC commands, instructions and functions; and numerous other programming and data processing expressions. The Commands within the Glossary are indicated in boldface type, with other expressions in italics. To give some idea of the extent of this Glossary, 221 entries have been provided — a miniature reference document in itself.

Overall, this is an excellent text, with a great deal of useful information and guidance provided at a very reasonable price. The author is a professor at Fairfield University, and a consultant to public schools on computer usage. This is reflected in the lucid and succinct manner of textual instruction throughout the book. If I have any criticism at all of this book, it is that there is what might be considered an excess of practice exercises at the end of each chapter. There are several methods of reinforced learning — one way is by the use of explained examples. There are many here, but more would be better. Another way is by work question exercises. This has its place in the classroom, but the average reader of this book is likely to be the new



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owner of a TRS-80 — a person anxious to get involved in programming, but too impatient to wade through pages and pages of exercise questions. Fortunately, solutions are provided in the back of the book. (I would suspect that Dr. Zabinski had it in mind that this text would receive extensive classroom use.) Unlike many computer instruction books written lately, this book is devoid of "cutesy" humor, which is somewhat refreshing, and leaves the impression that this tome is dedicated to the serious learner.

Production quality of this book is excellent — from slick multicolor soft cover, typeset text, to very impressive layout.

I can recommend this book without hesitation if your requirements fall within its scope, which cannot be better stated than in the Preface: ". . . . suitable for the self-learner or for a one-semester introductory course. . . . It is for the non-specialist who wants to learn to use the TRS-80 effectively."

"Introduction to TRS-80 Level II BASIC and Computer Programming" — Radio Shack Catalog No. 26-2116. $9.95

* * * *

MICROPROOF UPDATE: Shortly after the review for MICROPROOF was published (September), I received from Cornucopia Software a copy of their latest revision to this very fine spelling/typo checking program. A good program has been made better by several improvements, and you should know about them.

A new file within MICROPROOF called PRINTDIC now allows editing of the expandable dictionary file. It is merely necessary to call this file and all of the words you have added will be displayed. You now delete, change, or add words to the list and use ADDTODIC to put it all in your dictionary. An impressive way to get your special words into the dictionary at any time, for future checking. (There's always the chance you will learn the spelling of the words just by entering them, too!)

Further, MICROPROOF now displays in context. No longer do you need to puzzle and go on a Global Search with your word processor for some word that you may have forgotten just where it occurred. Or, it might be a "non-word" — I used to keep getting "fr." The phrase, "Display Word in Context" now appears on the screen with the other choices given under "Select Appropriate Response." To get the former, type "?" and the word under consideration will appear across the screen with the line in which it occurs. For instance, "of how to use the macine???diskette handling and" — the word, of course, is "macine" (should be "machine"), which is followed by the three

continued on page 42

PROGRAM CONVERSION (PART I)

Richard Kaplan

```
10 HOME
20 PRINT @ 500, "THIS IS THE FIRST IN A MONTHLY SERIES"
30 PRINT @ (20,20) "ON PROGRAM TRANSLATION BY RICHARD KAPLAN"
40 FOR I !=1 TO 10
50 PUT FILE (SYSPRINT) LIST ('IF YOU'RE HAVING
PROBLEMS DECIPHERING THIS
PROGRAM THEN (GOTO 60 OR READ THIS ARTICLE)')
60 GOTO 50
70 NEXT
80 READ ON ! ! ! !
```

If you attempted to run the above program and were thwarted by a SYNTAX ERROR, you can now stop banging on your computer. The above is simply a bona fide example of a poor attempt at program translation.

As the owner of a TRS-80 MODEL I, II, or III, no doubt you have experienced the frustrating scenario of seeing a terrific program in a computer magazine, only to be prevented by running it when you realized that the MODEL I, II, and III (and ALL microcomputers, for that matter) are not compatible with each other. Although most features of TRS-80 programming, at least, are consistent with all three models, Murphy's Law usually prevails and there is always at least one inconsistency in any program which you wish to run on your on machine.

I will be writing a monthly column concerning program translation to the TRS-80 models I, II, and III. The purpose of this column will be to enable an owner of one of these machines to translate any program written in BASIC to his own computer. I will deal primarily with translation solely among the three TRS-80's. If interest is strong enough, I might also deal with other popular microcomputers, such as the APPLE.

What is it that makes conversion so necessary? The most common problem in converting programs is dealing with graphics. Each of the three TRS-80's has its own method of dealing with graphics. In some way, virtually every graphics statement on the MODEL I, II, or III is different in some way from the statement to do the same thing on a different TRS-80. The character sets for each computer are also different. For this reason, a MODEL III program which uses one of the MODEL III's special character sets will not work on a MODEL I or a MODEL II. Similarly, a MODEL I program which uses PRINT @ statements will not work on a MODEL II without conversion because the MODEL I has 64 columns on its screen, while the MODEL II has 80 columns; therefore, PRINT @ coordinates will not remain constant between these two models.

Disk access is another area which poses a problem in many cases. The MODEL I does not support variable-length records (a special type of file in which the programmer can specify the number of characters which constitutes one "record" — more in a future month) under TRSDOS, as do both other machines. The MODEL II, on the other hand, does not support the OPEN "E" statement, which opens a sequential access output file to its end. The MODELS I and III, finally, do not support the MODEL II's OPEN "D" statement, which is an alternative form for OPEN "R" (which opens a random-access file).

Next month I will deal with the most fundamental topic in program conversion — the actual program transfer. Entering a 300K program into the computer is not a pleasing thought, but when a microcomputer owner upgrades to a MODEL II or to a MODEL III this is frequently the situation he is confronted with. I will discuss how to transfer your programs directly. This can generally be done by one of two methods: transmitting the program over an RS-232 interface, or converting disks which have differing formats.

In future months, I will cover one topic each month and discuss conversion techniques for applying this to each computer. I presently plan to cover graphics, disk access, screen size difficulties (80 columns vs. 64), and array functions (ERASE, SWAP, etc.).

If you have any comments or suggestions, or if there is a specific topic which you would like to see covered, let me know. All correspondence is welcomed. Simply write to Richard Kaplan, c/o H & E Computronics. ■

---

continued from page 41

question mark symbols to draw attention to the word in question. At this point you have the opportunity to respond in the same way as for the other alternatives, by correcting the word, leaving it, adding to the dictionary (or to exit the program).

The "fr" I was getting? By placing the cursor at the very beginning of my copy I had inadvertently included the symbol for "flush-right," which was picked up as a "non-word."

The manual has been revised and expanded to explain these new features, and additional information has been provided. Also, the price structure has been revised — downward! — now making it an extremely versatile and useful writing tool for what now must be considered a low cost.

The phenomenal speed of operation of this Z-80 machine language program has not lessened by any means — one minute to proof 3000 words is specified — it seems much faster. MICROPROOF operates with Scripsit™ and Lazy Writer™ for the Models I, II, and III.

A. A. Wicks
30646 Rigger Road
Agoura, CA 91301 ■

VOL. 4 - DISASSEMBLED HANDBOOK FOR TRS-80

Robert M. Richardson

CHAPTER 10

110 BAUD ASCII RADIO TELETYPE TRANSMIT AND RECEIVE PROGRAM

INTRODUCTION

Here we are in the last Chapter of Vol. 4. Concatenating the programs from Chapters 8 & 9; i.e., "putting it all together," for a real honest-to-goodness working 110 Baud ASCII transmit and receive program. The ASCII radio teletype programs are both the simplest, and therefore the shortest, in Volume 4.

WHY DID YOU HOLD OFF THE EASIEST TILL THE LAST ? ? ?

Well Gridley, somehow or other you managed to survive the Morse and Baudot code programs, so we thought that by gradually tapering off on the degree of difficulty towards the end you would realize how "truly easy" code conversion can be. THAT'S CRAZY. I NEARLY DIDN'T SURVIVE CHAPTERS 1 THROUGH 7:

But you DID survive Grid, and that's the proof of the pudding.

COMPLIMENTS WILL GET YOU ANTHING. WHAT DO YOU WANT NOW ?

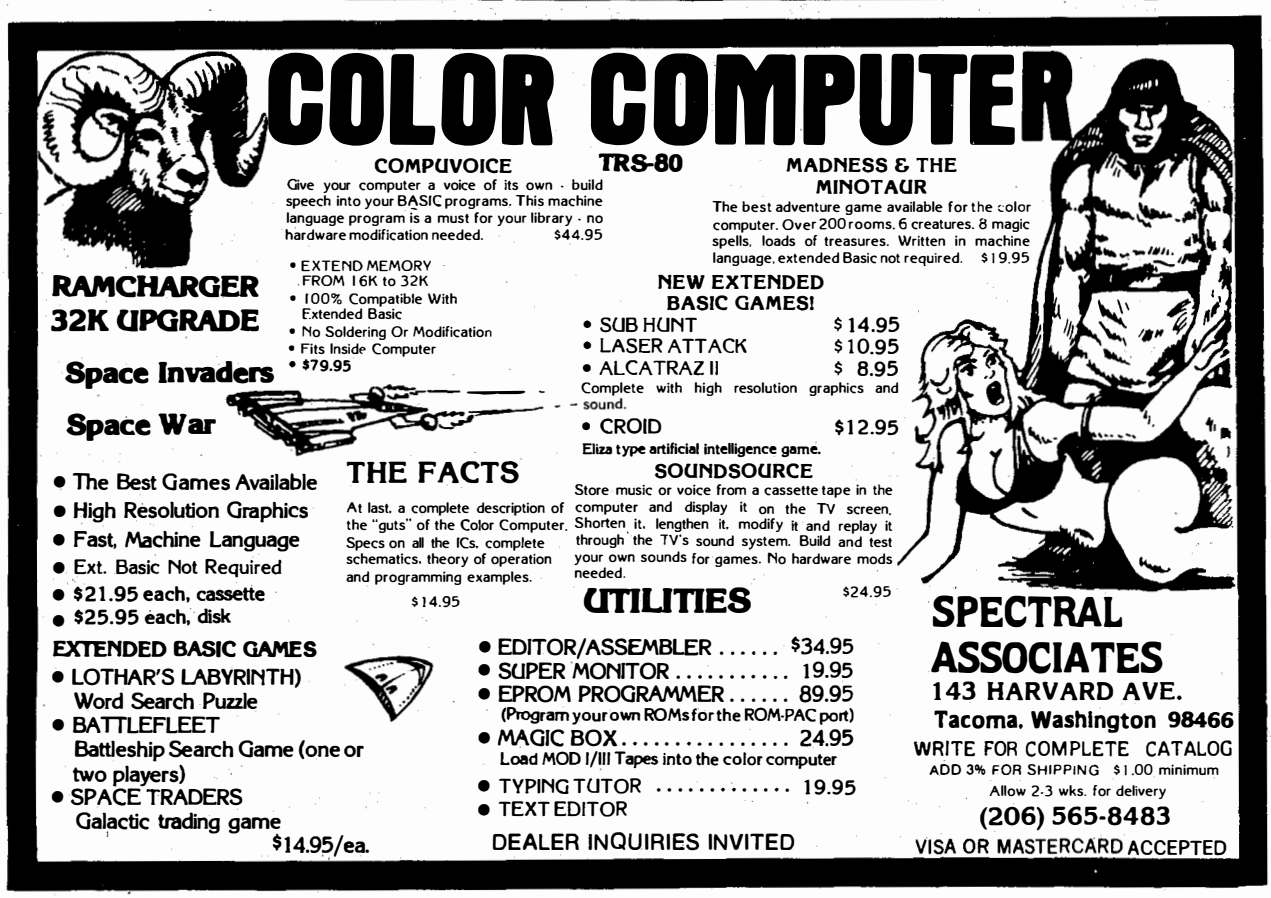
Well Gridley, all I want you to do now is to "hang in there" till we put both Chapters 8's and 9's programs together into a solid working program. Just a bit more patience and fortitude. WHAT DO YOU MEAN BY THAT ? ? ? I AM ONLY A FIGMENT OF YOUR WEIRD IMAGINATION ! ! ! AREN'T I ? ? ?

Certainly not, Gridley. We have our differences at times, but you have been a real person to all of us since Volume I was written two years ago and you've made many fine contributions.

WHAT CONTRIBUTIONS HAVE I SUPPOSEDLY MADE ? ? ?

1. You have fastidiously kept us from taking ourselves too seriously. Everytime we believe that we are about to reinvent the wheel, you bring us back to the mundane planet earth and put things into proper perspective.

2. The renowned author and our learned friend, Dr.



David Lien, used your good services in his bestseller, *Learning Level I, that has had over 300,000 copies printed to date.*

3. My new book, The Gunnplexer Cookbook — A 10 Gigahertz Microwave Primer, is even dedicated to you, Grid Gridley.

This brings us full circle, Gridley. What is the difference between reality and imagination? If you imagine something is real Grid old friend, is it truly real?

YES, OF COURSE IT IS TO THE ONE DOING THE IMAGINING ! ! !

Thank you, Gridley. Don't ever leave us and let us take ourselves too seriously. Enough philosophizing for now. Let's get on with putting these ASCII programs together, together.

ASCII RTTY - PUTTING IT ALL TOGETHER - PROGRAM MODIFICATIONS

We have tried our best to make concatenating Chapter 8's transmit program and Chapter 9's receive program as easy as possible. Changes and modifications are only minimal.

Load Chapter 8's source code into the Radio Shack EDTASM followed by Chapter 9's source code. The first order of business is to renumber the concatenated program using the EDTASM's N100,10 command. You will note that lines numbers 100 through 3620 in the transmit program have NOT changed.

We'll try to cover ALL the modifications in sequential order starting with the transmit program and then proceeding to the receive program.

Change line 900 to:

```
00900    JP     Z,MODE     ;IF SO, GOTO RECEIVE MODE
```

Change line 2350 to:

(substitute U*U*U* for RYRYRY)

Change line 3330 to:

(substitute U*U*U*U*U*U*, etc. for ALL the RYRYRYRYRY, etc.)

NOTE: As previously discussed, the U* test accomplishes the same thing, testing all the bits of the ASCII code that are used (7), as does the RY with the 5 bit Baudot code.

DELETE lines 3630-3650 as we will tack lines 3630 & 3640 on to the very end of the combined program.

WHY DO WE HAVE TO DO THAT ? ? ?

You do not HAVE TO, Gridley. If you do though, you will be able to use ALL the memory remaining in your TRS-80 for the "input a message" subroutine in the transmit mode.

DELETE former line numbers 150 through 220 in the receive mode program. If you added the CLS subroutine to former receive program line numbers 225, and 1322 through 1327, DELETE them also as the CLS subroutine is only used in the transmit section of the program and assures Model III compatibility. Now, renumber the combined program again with N100,10. If all is well, the new receive mode line numbers should appear identical to that shown in the combined program listing in this Chapter, except for a few lines at the program end.

Change new line numbers 3760 & 3870 (these were formerly receive program line numbers 310 & 420) to:

```
03760    JP     Z,GO1      ;IF SO, GOTO TRANSMIT MODE
03870    JP     Z,GO1      ;IF SO, GOTO TRANSMIT MODE
```

DELETE former receive program line numbers 1300-1330 as they are duplications of the CARRET subroutine in transmit mode.

ADD the following liness to the very end of the program:

```
04750 INPUT1  DEFM   'YOU FORGOT TO INPUT A MESSAGE '
04760         DEFB   0          ;MESSAGE DELIMITER
04770         END    W4UCH      ;EL FIN = EL BEGUINE
```

Hopefully, the foregoing is the extent of the changes necessary to combine the programs in Chapters 8 and 9.

IF your combined programs are identical to this program list, you will have approximately the following bytes left in MEM available for the "input a message" subroutine:

MEM	16K MEM	32K MEM	48K MEM
BYTES	943	17327	33711
PAGES	.9	16.9	32.9

Pages are figured at 16 lines of 64 characters per line of solid text AND DO NOT include carriage returns. As such, the number of pages may be tripled, quadrupled or more, depending upon the carriage returns per page.

AUTOMATIC TRANSMIT/RECEIVE RELAY SWITCHING

If you wish to use the VAR/80 to switch your transmitter, receiver, and antenna relay from transmit to receive or vice versa AUTOMATICALLY whenever you press the CLEAR key, simply modify this program's output to the VAR/80 so that the latching relay at DBO zero controls your station's T/R switches and/or relays. Chapter 7's last page details the approach we used with the combined Baudot RTTY program. The same approach will work equally as well with this program.

10 MINUTE SEMI-AUTOMATIC MORSE IDENTIFICATION FOR RTTY

The F.C.C. requires that each amateur station operating Baudot or ASCII radio teletype identify itself

once every 10 minutes via Morse code when operating in the CW/RTTY portions of the amateur bands. A minimum of 100 cycles frequency shift is required for this Morse I.D.

Courtesy, and possible forthcoming new regulations, dictates that the call sign of the station being worked also be tranmitted. A typical sequence on RTTY would be: "W2CIX/3 IN PITTSBURGH THIS IS W4UCH/2 CHAUTAUQUA NY. MORSE I.D. FOLLOWS" We now have the option of using a hand key, bug, paddle, Morse keyer PCB, or what-have-you to key the Flesher TU-170 terminal unit which has a key jack on its rear panel. The TU-170 outputs a 2225 cycle tone key down and the standard 2125 cycle Mark tone for key up. REMEMBER: the TU-170 MUST have the TTL signal from the VAR/80 inverted by a single gate from a 7404 TTL inverter chip between the VAR/80 and TU-170 unless you wish to transmit an inverted signal (switched Mark and Space tones). The crystal-controlled Circuit Board Specialists AFSK generator does NOT require the 7404 inverter chip. The optional 7404 inverter was described earlier in Chapter 5.

SENDING THE I.D. IN MORSE CODE

Assuming we have a keyer for the TU-170 (any of the varieties previously mentioned) plugged in and ready to go, we would then send the following message in Morse code:

W2CIX/3 DE W4UCH/2 KN

The generally accepted meaning of the KN terminator is: "over to W2CIX/3, we are NOT listening for breakers." If you wish to listen for breakers, then just end the Morse I.D. with a K and give a short courteous listen for any breakers before W2CIX/3 transmits his Morse I.D. (we presume that both stations wish to I.D., one after the other, before resuming ASCII radio teletype operation). IF you DO NOT wish to turn over operation to the station being worked, and wish to continue your RTTY meassage, just leave off the KN or K at the end of the I.D. and resume transmitting your RTTY message.

As previously mentioned, there are about as many ways of effecting the 10 minute Morse I.D. as one can imagine. They vary from a simple "wind-up" mechanical timer that ding-a-lings at the end of 10 minutes and allows you to manually key in the Morse I.D. on the TU-170, to a modestly simple solid-timer that is re-initialized every time you have sent a Morse code I.D. (see QST magazine for those on the market).

HOW TO SEND THE MORSE I.D. SEMI-AUTOMATICALLY

Overlooking our old motor driven "code-disk" with a photo-electric eye scanning the perforated holes we razor-cut into an old shirt-back piece of cardboard

text continued on page 49

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```
0010Ø ; W4UCH ASCII TELETYPE TRANSMIT &
RECEIVE SYSTEM PROGRAM
0011Ø ;
0012Ø ; 11Ø BAUD (MAY BE MODIFIED FOR
3ØØ BAUD)    ASCII 5 & 6
0013Ø ;
0014Ø ; COPYRIGHT (C) 1981
0015Ø ;
0016Ø W4UCH   EQU    29ØØØ
0017Ø         ORG    W4UCH
0018Ø         EX     AF,AF'
0019Ø         EXX
0020Ø         PUSH   IX
0021Ø         PUSH   IY
0022Ø         DI
0023Ø         CALL   CLS
0024Ø         JP     GO2
0025Ø GO1     CALL   CARRET
0026Ø GO2     LD     A,Ø
0027Ø         LD     (SIGN3),A
0028Ø         LD     HL,MESS
0029Ø         CALL   28A7H
0030Ø         CALL   CARRET
0031Ø         LD     A,ØEH
0032Ø         CALL   Ø33H
0033Ø         JP     SEND
0034Ø SPEED2  DEFW   61Ø
0035Ø MESS    DEFM   'TRANSMIT MODE
11Ø BAUD'
0036Ø         DEFB   Ø
0037Ø SEND    PUSH   AF
0038Ø         LD     A,(SIGN3)
0039Ø         INC    A
0040Ø         LD     (SIGN3),A
0041Ø         CP     72
0042Ø         CALL   Z,AUTO1
0043Ø         POP    DE
0044Ø SEND1   LD     L,Ø
0045Ø         CALL   SPACE
0046Ø SEND2   BIT    Ø,D
0047Ø         CALL   NZ,MARK
0048Ø         BIT    Ø,D
0049Ø         CALL   Z,SPACE
0050Ø         INC    L
0051Ø         LD     A,8
0052Ø         CP     L
0053Ø         JP     Z,FINIS1
0054Ø         RRC    D
0055Ø         JP     SEND2
0056Ø SPACE   LD     A,4
0057Ø         OUT    (Ø),A
0058Ø         LD     BC,(SPEED2)
0059Ø         CALL   Ø6ØH
0060Ø         RET
0061Ø MARK    LD     A,Ø
0062Ø         OUT    (Ø),A
0063Ø         LD     BC,(SPEED2)
0064Ø         CALL   Ø6ØH
0065Ø         RET
0066Ø CARRET  LD     A,13
0067Ø         CALL   Ø33H
0068Ø         RET
0069Ø TIME6   LD     A,Ø
0070Ø         OUT    (Ø),A
0071Ø         LD     BC,(SPEED2)
0072Ø         CALL   Ø6ØH
0073Ø         RET
0074Ø TIME7   DEFW   18ØØØ
0075Ø FINIS1  CALL   TIME6
0076Ø         CALL   TIME6
0077Ø KYBD2   LD     A,(SIGN2)
0078Ø         CP     1
0079Ø         JP     Z,SEND4
0080Ø         CALL   Ø49H
0081Ø XMIT3   CP     32
0082Ø         JP     Z,VIDEO2
0083Ø         CP     98
0084Ø         JP     Z,BASIC
0085Ø         CP     27
0086Ø         JP     Z,MENU
0087Ø         CP     91
0088Ø         JP     Z,SEND5
0089Ø         CP     31
0090Ø         JP     Z,MODE
0091Ø         CP     96
0092Ø         JP     P,KYBD2
0093Ø VIDEO2  CALL   Ø33H
0094Ø         JP     SEND
0095Ø BASIC   EX     AF,AF'
0096Ø         EXX
0097Ø         POP    IY
0098Ø         POP    IX
0099Ø         JP     1A19H
01ØØØ AUTO1   LD     A,93
Ø1Ø1Ø         CALL   Ø33H
Ø1Ø2Ø         LD     A,Ø
Ø1Ø3Ø         LD     (SIGN3),A
Ø1Ø4Ø         CALL   SPACE
Ø1Ø5Ø         CALL   SPACE
Ø1Ø6Ø         CALL   MARK
Ø1Ø7Ø         CALL   SPACE
Ø1Ø8Ø         CALL   SPACE
Ø1Ø9Ø         CALL   MARK
Ø11ØØ         CALL   MARK
Ø111Ø         CALL   MARK
Ø112Ø         CALL   MARK
Ø113Ø         CALL   MARK
Ø114Ø         CALL   MARK
Ø115Ø         LD     BC,(TIME7)
Ø116Ø         CALL   Ø6ØH
Ø117Ø         RET
Ø118Ø SEND5   LD     A,1
Ø119Ø         LD     (SIGN2),A
Ø12ØØ         CALL   Ø49H
Ø121Ø         JP     SEND6
Ø122Ø MENU    CALL   CLS
Ø123Ø         CALL   CARRET
Ø124Ø         LD     HL,MENU1
Ø125Ø         CALL   28A7H
Ø126Ø         CALL   CARRET
Ø127Ø         CALL   CARRET
Ø128Ø         LD     HL,MS1
Ø129Ø         CALL   28A7H
Ø13ØØ         CALL   CARRET
Ø131Ø         LD     HL,MS2
Ø132Ø         CALL   28A7H
Ø133Ø         CALL   CARRET
Ø134Ø         LD     HL,MS3
Ø135Ø         CALL   28A7H
Ø136Ø         CALL   CARRET
Ø137Ø         LD     HL,MS4
Ø138Ø         CALL   28A7H
Ø139Ø         CALL   CARRET
Ø14ØØ         LD     HL,MS5
Ø141Ø         CALL   28A7H
Ø142Ø         CALL   CARRET
Ø143Ø         LD     HL,MS6
Ø144Ø         CALL   28A7H
Ø145Ø         CALL   CARRET
Ø146Ø         LD     HL,MS7
Ø147Ø         CALL   28A7H
Ø148Ø         CALL   CARRET
Ø149Ø         LD     HL,MS8
Ø15ØØ         CALL   28A7H
Ø151Ø         CALL   CARRET
Ø152Ø         LD     HL,MS9
Ø153Ø         CALL   28A7H
Ø154Ø         CALL   CARRET
Ø155Ø         LD     HL,MS1Ø
Ø156Ø         CALL   28A7H
Ø157Ø         CALL   CARRET
Ø158Ø         LD     HL,MS1ØA
Ø159Ø         CALL   28A7H
Ø16ØØ         CALL   CARRET
Ø161Ø         CALL   CARRET
Ø162Ø         LD     HL,MS11
Ø163Ø         CALL   28A7H
Ø164Ø         CALL   Ø49H
Ø165Ø         PUSH   AF
Ø166Ø         CALL   CLS
Ø167Ø         POP    AF
Ø168Ø SEND6   CP     65
Ø169Ø         JP     Z,CQ
Ø17ØØ         CP     66
Ø171Ø         JP     Z,QTH
Ø172Ø         CP     67
Ø173Ø         JP     Z,CQDX
Ø174Ø         CP     68
Ø175Ø         JP     Z,CQSS
Ø176Ø         CP     69
Ø177Ø         JP     Z,QRZ
Ø178Ø         CP     7Ø
Ø179Ø         JP     Z,SEVEN3
Ø18ØØ         CP     71
Ø181Ø         JP     Z,RST59
Ø182Ø         CP     72
Ø183Ø         JP     Z,RST55
```

```
Ø184Ø          CP      73
Ø185Ø          JP      Z,QRX
Ø186Ø          CP      74
Ø187Ø          JP      Z,QRM
Ø188Ø          CP      75
Ø189Ø          JP      Z,QRN
Ø19ØØ          CP      76
Ø191Ø          JP      Z,QSY
Ø192Ø          CP      77
Ø193Ø          JP      Z,QSYUP
Ø194Ø          CP      78
Ø195Ø          JP      Z,QSYDN
Ø196Ø          CP      79
Ø197Ø          JP      Z,SECT
Ø198Ø          CP      8Ø
Ø199Ø          JP      Z,TRS8Ø
Ø2ØØØ          CP      81
Ø2Ø1Ø          JP      Z,PGMHR
Ø2Ø2Ø          CP      82
Ø2Ø3Ø          JP      Z,RIGHR
Ø2Ø4Ø          CP      83
Ø2Ø5Ø          JP      Z,RYRY
Ø2Ø6Ø          CP      84
Ø2Ø7Ø          JP      Z,QUICK
Ø2Ø8Ø          CP      85
Ø2Ø9Ø          JP      Z,HANDL
Ø21ØØ          CP      86
Ø211Ø          JP      Z,INPUT2
Ø212Ø          CP      87
Ø213Ø          JP      Z,INPUT
Ø214Ø          JP      MENU
Ø215Ø MENU1    DEFM    '
          PREPARED MESSAGE SUBROUTINE'
Ø216Ø          DEFB    Ø
Ø217Ø MS1      DEFM    '        CQ = A
                          QTH = B'
Ø218Ø          DEFB    Ø
Ø219Ø MS2      DEFM    '        CQ DX = C
                        CQ SS = D'
Ø22ØØ          DEFB    Ø
Ø221Ø MS3      DEFM    '        QRZ = E
                       73 = F'
Ø222Ø          DEFB    Ø
Ø223Ø MS4      DEFM    '        RST 5X9
PLUS = G                  RST 5X5 = H'
Ø224Ø          DEFB    Ø
Ø225Ø MS5      DEFM    '        QRX = I
                       QRM = J'
Ø226Ø          DEFB    Ø
Ø227Ø MS6      DEFM    '        QRN = K
                       QSY = L'
Ø228Ø          DEFB    Ø
Ø229Ø MS7      DEFM    '        QSY UP =
M                      QSY DOWN = N'
Ø23ØØ          DEFB    Ø
Ø231Ø MS8      DEFM    '        SECTION =
O                       TRS-8Ø = P'
Ø232Ø          DEFB    Ø
Ø233Ø MS9      DEFM    '        PROGRAM
HERE = Q                     RIG HERE = R'
Ø234Ø          DEFB    Ø
Ø235Ø MS1Ø     DEFM    '        RYRYRY =
S    QUICK BROWN = T'
Ø236Ø          DEFB    Ø
Ø237Ø          CALL    CARRET
Ø238Ø MS1ØA    DEFM    '        HANDLE =
U                      INPUT MESSAGE =
V & W'
Ø239Ø          DEFB    Ø
Ø24ØØ          CALL    CARRET
Ø241Ø MS11     DEFM    '
ENTER PREPARED MESSAGE DESIRED ?  '
Ø242Ø          DEFB Ø
Ø243Ø CQ       LD      IY,CQ1
Ø244Ø          JP      SEND3
Ø245Ø QTH      LD      IY,QTH1
Ø246Ø          JP      SEND3
Ø247Ø CQDX     LD      IY,CQDX1
Ø248Ø          JP      SEND3
Ø249Ø CQSS     LD      IY,CQSS1
Ø25ØØ          JP      SEND3
Ø251Ø QRZ      LD      IY,QRZ1
Ø252Ø          JP      SEND3
Ø253Ø SEVEN3   LD      IY,SVN31
Ø254Ø          JP      SEND3
Ø255Ø RST59    LD      IY,RST591
Ø256Ø          JP      SEND3
Ø257Ø RST55    LD      IY,RST551
Ø258Ø          JP      SEND3
Ø259Ø QRX      LD      IY,QRX1
Ø26ØØ          JP      SEND3
Ø261Ø QRM      LD      IY,QRM1
Ø262Ø          JP      SEND3
Ø263Ø QRN      LD      IY,QRN1
Ø264Ø          JP      SEND3
Ø265Ø QSY      LD      IY,QSY1
Ø266Ø          JP      SEND3
Ø267Ø QSYUP    LD      IY,QSYUP1
Ø268Ø          JP      SEND3
Ø269Ø QSYDN    LD      IY,QSYDN1
Ø27ØØ          JP      SEND3
Ø271Ø SECT     LD      IY,SECT1
Ø272Ø          JP      SEND3
Ø273Ø TRS8Ø    LD      IY,TRS8Ø1
Ø274Ø          JP      SEND3
Ø275Ø PGMHR    LD      IY,PGMHR1
Ø276Ø          JP      SEND3
Ø277Ø RIGHR    LD      IY,RIGHR1
Ø278Ø          JP      SEND3
Ø279Ø RYRY     LD      IY,RYRY1
Ø28ØØ          JP      SEND3
Ø281Ø QUICK    LD      IY,QUICK1
Ø282Ø          JP      SEND3
Ø283Ø HANDL    LD      IY,HANDL1
Ø284Ø          JP      SEND3
Ø285Ø INPUT    LD      IY,INPUT1
Ø286Ø          JP      SEND3
Ø287Ø SEND3    LD      A,1
Ø288Ø          LD      (SIGN2),A
Ø289Ø SEND4    LD      A,(IY)
Ø29ØØ          CP      Ø
Ø291Ø          JP      Z,KYBD3
Ø292Ø          INC     IY
Ø293Ø          JP      XMIT3
Ø294Ø KYBD3    LD      A,Ø
Ø295Ø          LD      (SIGN2),A
Ø296Ø          JP      KYBD2
Ø297Ø CQ1      DEFM    'cQ CQ CQ DE
W4UCH/2 W4UCH/2 K K K '
Ø298Ø          DEFB    Ø
Ø299Ø QTH1     DEFM    'QTH IS BOX 1Ø65 -
CHAUTAUQUA LAKE, NEW YORK 14722 '
Ø3ØØØ          DEFB    Ø
Ø3Ø1Ø CQDX1    DEFM    'CQ DX CQ DX CQ DX
DE W4UCH/2 K K K '
Ø3Ø2Ø          DEFB    Ø
Ø3Ø3Ø CQSS1    DEFM    'CQ SS CQ SS CQ SS
DE W4UCH/2 K K K '
Ø3Ø4Ø          DEFB    Ø
Ø3Ø5Ø QRZ1     DEFM    'QRZ QRZ QRZ DE
W4UCH/2 K K K '
Ø3Ø6Ø          DEFB    Ø
Ø3Ø7Ø SVN31    DEFM    '73 TO YOU AND
URS. MNY TNX FB QSO. DE W4UCH/2 K K K '
Ø3Ø8Ø          DEFB    Ø
Ø3Ø9Ø RST591   DEFM    'UR RST 5X9
PLUS...A WHOPPING BIG SIGNAL HERE AT
CHAUTAUQUA LAKE '
Ø31ØØ          DEFB    Ø
Ø311Ø RST551   DEFM    'UR RST 5X5 WITH
MODEST QSB.  LETS HOPE THE BAND
IMPROVES. '
Ø312Ø          DEFB    Ø
Ø313Ø QRX1     DEFM    'QRX A MINUTE. THE
PHONE. STANDBY. '
Ø314Ø          DEFB    Ø
Ø315Ø QRM1     DEFM    'QRM QUITE BAD.
PLEASE TRY AGAIN. DE W4UCH/2 K K K '
Ø316Ø          DEFB    Ø
Ø317Ø QRN1     DEFM    'LOCAL QRN
TERRIBLE. PLEASE TRY AGAIN. DE W4UCH/2
K K K '
Ø318Ø          DEFB    Ø
Ø319Ø QSY1     DEFM    'QRM TERRIBLE.
LETS QSY? WHERE MOVE? DE W4UCH/2 K K K '
Ø32ØØ          DEFB    Ø
Ø321Ø QSYUP1   DEFM    'LETS BOTH MOVE UP
1 KHZ UP 1 KHZ? DE W4UCH/2 K K K '
Ø322Ø          DEFB    Ø
Ø323Ø QSYDN1   DEFM    'LETS BOTH MOVE
DOWN 1 KHZ DOWN 1 KHZ? DE W4UCH/2 K K K '
```

```
Ø324Ø          DEFB    Ø
Ø325Ø SECT1    DEFM    'ARRL SECTION IS
WEST. NY - WEST. NY DE W4UCH/2 K K K '
Ø326Ø          DEFB    Ø
Ø327Ø TRS8Ø1   DEFM    'TRS-8Ø
MICROCOMPUTER HERE IS DOING ALL THE WORK
FOR ME. '
Ø328Ø          DEFB    Ø
Ø329Ø PGMHR1   DEFM    'PROGRAM IS FROM
DISASSEMBLED HANDBOOK FOR TRS-8Ø
VOLUME 4. '
Ø33ØØ          DEFB    Ø
Ø331Ø RIGHR1   DEFM    'RIG HR IS OLD
HT-37, ITT 3Ø21 RECVR AND DIPOLE IN THE
ATTIC. '
Ø332Ø          DEFB    Ø
Ø333Ø RYRY1    DEFM    'RYRYRYRYRYRYRYRY
RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRY '
Ø334Ø          DEFB    Ø
Ø335Ø QUICK1   DEFM    'THE QUICK BROWN
FOX JUMPED OVER THE LAZY DOGS.
Ø123456789 '
Ø336Ø          DEFB    Ø
Ø337Ø HANDL1   DEFM    'HANDLE IS (BOB).
35 YEARS HAMMING, BUT NEW TO ASCII
RTTY. '
Ø338Ø          DEFB    Ø
Ø339Ø INPUT2   LD      HL,INPUT1
Ø34ØØ INPUT3   CALL    Ø49H
Ø341Ø          CP      8
Ø342Ø          JP      Z,BACK
Ø343Ø          CP      1ØØ
Ø344Ø          JP      Z,DONE
Ø345Ø          LD      (HL),A
Ø346Ø          CALL    Ø33H
Ø347Ø          INC     HL
Ø348Ø          JP      INPUT3
Ø349Ø BACK     DEC     HL
Ø35ØØ          CALL    Ø33H
Ø351Ø          JP      INPUT3
Ø352Ø DONE     LD      A,Ø
Ø353Ø          LD      (HL),A
Ø354Ø          JP      KYBD2
Ø355Ø SIGN2    DEFB    Ø
Ø356Ø SIGN3    DEFB    Ø
Ø357Ø CLS      CALL    Ø1C9H
Ø358Ø          LD      A,Ø
Ø359Ø          OUT     (224),A
Ø36ØØ          LD      A,48
Ø361Ø          OUT     (236),A
Ø362Ø          RET
Ø363Ø ;
Ø364Ø ; W4UCH ASCII RADIO TELETYPE
RECEIVE PROGRAM
Ø365Ø ;
Ø366Ø ; FOR BEST RESULTS: TIME 1 = 61Ø
AND TIME 2 = 3Ø5
Ø367Ø ;
Ø368Ø MODE     LD      BC,33ØØØ
Ø369Ø          CALL    Ø6ØH
Ø37ØØ          CALL    CARRET
Ø371Ø          LD      HL,RECV
Ø372Ø          CALL    28A7H
Ø373Ø          CALL    CARRET
Ø374Ø GO       LD      A,(144ØØ)
Ø375Ø          CP      2
Ø376Ø          JP      Z,GO1
Ø377Ø          IN      A,(Ø)
Ø378Ø          CP      127
Ø379Ø          JP      Z,GO
Ø38ØØ          LD      BC,(TIME3)
Ø381Ø          CALL    Ø6ØH
Ø382Ø          IN      A,(Ø)
Ø383Ø          CP      127
Ø384Ø          JP      Z,GO
Ø385Ø START    LD      A,(144ØØ)
Ø386Ø          CP      2
Ø387Ø          JP      Z,GO1
Ø388Ø          IN      A,(Ø)
Ø389Ø          CP      127
Ø39ØØ          JP      NZ,START
Ø391Ø          LD      D,Ø
Ø392Ø          LD      BC,(TIME2)
Ø393Ø          CALL    Ø6ØH
Ø394Ø BITØ     LD      BC,(TIME1)
Ø395Ø          CALL    Ø6ØH
Ø396Ø          IN      A,(Ø)
Ø397Ø          CP      127
Ø398Ø          JP      NZ,SETØ
Ø399Ø          SET     Ø,A
Ø4ØØØ          JP      BIT1
Ø4Ø1Ø BIT1     LD      BC,(TIME1)
Ø4Ø2Ø          CALL    Ø6ØH
Ø4Ø3Ø          IN      A,(Ø)
Ø4Ø4Ø          CP      127
Ø4Ø6Ø          SET     Ø,A
Ø4Ø7Ø          JP      BIT2
Ø4Ø8Ø BIT2     LD      BC,(TIME1)
Ø4Ø9Ø          CALL    Ø6ØH
Ø41ØØ          IN      A,(Ø)
Ø411Ø          CP      127
Ø412Ø          JP      NZ,SET2
Ø413Ø          SET     Ø,A
Ø414Ø          JP      BIT3
Ø415Ø BIT3     LD      BC,(TIME1)
Ø416Ø          CALL    Ø6ØH
Ø417Ø          IN      A,(Ø)
Ø418Ø          CP      127
Ø419Ø          JP      NZ,SET3
Ø42ØØ          SET     Ø,A
Ø421Ø          JP      BIT4
Ø422Ø BIT4     LD      BC,(TIME1)
Ø423Ø          CALL    Ø6ØH
Ø424Ø          IN      A,(Ø)
Ø425Ø          CP      127
Ø426Ø          JP      NZ,SET4
Ø427Ø          SET     Ø,A
Ø428Ø          JP      BIT5
Ø429Ø BIT5     LD      BC,(TIME1)
Ø43ØØ          CALL    Ø6ØH
Ø431Ø          IN      A,(Ø)
Ø432Ø          CP      127
Ø433Ø          JP      NZ,SET5
Ø434Ø          SET     Ø,A
Ø435Ø          JP      BIT6
Ø436Ø BIT6     LD      BC,(TIME1)
Ø437Ø          CALL    Ø6ØH
Ø438Ø          IN      A,(Ø)
Ø439Ø          CP      127
Ø44ØØ          JP      NZ,SET6
Ø441Ø          SET     Ø,A
Ø442Ø          JP      SHOW
Ø443Ø SHOW     LD      BC,(TIME1)
Ø444Ø          CALL    Ø6ØH
Ø445Ø          LD      A,D
Ø446Ø          CP      13
Ø447Ø          JP      Z,VID
Ø448Ø          CP      32
Ø449Ø          JP      M,TIME
Ø45ØØ          CP      96
Ø451Ø          JP      P,TIME
Ø452Ø VID      CALL    Ø33H
Ø453Ø TIME     LD      BC,(TIME1)
Ø454Ø          CALL    Ø6ØH
Ø455Ø          JP      START
Ø456Ø SETØ     SET     Ø,D
Ø457Ø          JP      BIT1
Ø458Ø SET1     SET     1,D
Ø459Ø          JP      BIT2
Ø46ØØ SET2     SET     2,D
Ø461Ø          JP      BIT3
Ø462Ø SET3     SET     3,D
Ø463Ø          JP      BIT4
Ø464Ø SET4     SET     4,D
Ø465Ø          JP      BIT5
Ø466Ø SET5     SET     5,D
Ø467Ø          JP      BIT6
Ø468Ø SET6     SET     6,D
Ø469Ø          JP      SHOW
Ø47ØØ TIME1    DEFW    61Ø
Ø471Ø TIME2    DEFW    3Ø5
Ø472Ø TIME3    DEFW    71Ø
Ø473Ø RECV     DEFM    'RECEIVE MODE -
 11Ø BAUD'
Ø474Ø          DEFB    Ø
Ø475Ø INPUT1   DEFM    'YOU FORGOT TO
INPUT A MESSAGE - YOU FORGOT TO INPUT A
MESSAGE '
Ø476Ø          DEFB    Ø
Ø477Ø          END     W4UCH
```

continued from page 45

some 20-odd years ago, there are many ways of sending the Morse I.D. semi-automatically, circa 1981/1982. We will just mention a few of the more obvious methods that may strike your fancy:

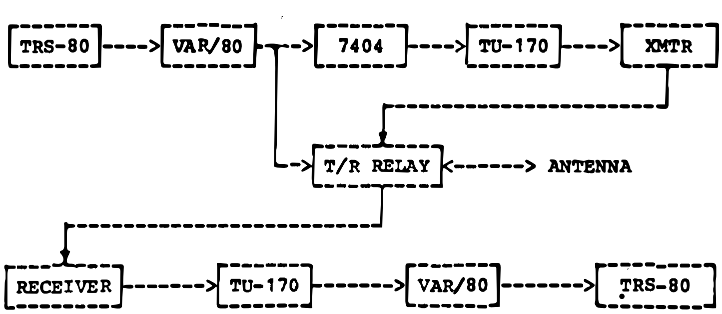
1. Purchase or make a diode/matrix PCB (printed circuit board) that has your own CALL letters + DE built-in to it.
2. Program an EPROM with your CALL letters + DE, programmed into it and use the new Design Solution system to CALL it.
3. Load a small part of Chapter 4's program into LOWER MEM and CALL it when you wish to send its "input message" subroutine; i.e., W2CIX/3 DE W4UCH/2. Use bit 1 of the VAR/80's DBO to drive the TU-170 CW key input.

There are MANY more ways to accomplish the same end objective. Those approaches listed above may give you some ideas that will be of assistance in determining which is best for you. Surely method number 1 is the simplest approach. Personally, we prefer a modified version of number 3 that is tacked on to this Chapter's transmit section of the program. It is loaded with the other station's call letters from a modified version of the prepared message subroutine by pressing "X" and the I.D. message transmitted in Morse by pressing "Y".

EXPANDING ON APPROACH NUMBER TWO

During summer/fall 1981, Design Solution, Inc. will be introducing a new product that may be plugged directly into the Model I or Model III's I/O bus adaptor. It comprises a very unique black box that will hold four 2716 EPROMs. Each 2716 is capable of holding 2K eight bit bytes. Why not load this Chapter's program (with the Morse I.D. modification) into 2 EPROMs if you do not have disk. As such, you will NOT have to load the program from cassette each time you wish to run it. Why not, indeed. Hopefully, we will be able to expand on this interesting approach in Volume 5.

STATION LAYOUT BLOCK DIAGRAM USING THE TU-170



COMPARISONS - ASSEMBLING YOUR OWN SYSTEM VS. READY-TO-GO

The new Macrotronics "TERMINALL" Morse, Baudot RTTY, and ASCII RTTY system at $503 per copy is the very MINIMUM system we would recommend to anyone not wishing to assemble their own. There are numerous other fine systems using internal dedicated microcomputers such as the HAL Devices product line, but their truly good quality units retail in the $2000+ ballpark.

ADVANTAGES OF READY-TO-GO:

1. Single package purchase. $503 and up.
2. No knowledge of assembly language programming necessary. It is ALL done for you. NO source/comments are needed.
3. Auto-adaptive Morse algorithm. May copy the weird ones.
4. 60, 66, 75, & 100 speed Baudot and 75 & 110 Baud ASCII.
5. Disk based "Mail Box" program optional for approx. $100.

ADVANTAGES OF ASSEMBLING YOUR OWN SYSTEM:

1. Choice of building your own TU or buying one. Save $250+.
2. Thorough UNDERSTANDING of the complete program. Modify it as you wish for your own style of operation.
3. If desired, use the TU-170 with the Morse program to take advantage of its exceptionally fine limiting capabilities.
4. Use the VAR/80 interface for myriad other applications.
5. WE believe the TU-170 is as good as or better than ANY terminal unit on the market selling for under $1000.
6. Personal PRIDE and SELF-ESTEEM from doing it yourself.

A W1AW DX BULLETIN ON 110 BAUD ASCII COPIED WITH THIS PROGRAM

(this bulletin was copied on 14.095 MHz at 6:00 PM EST)

```
U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*
U*U*U*U*
U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*
U*U*U*U*

QST DE W1AW
HR DX BULLETIN NR 14 FROM ARRL HEADQUARTERS
NEWINGTON CT  APRIL 9, 1981
TO ALL RADIO AMATEURS  BT

THANKS TO THE SOUTHERN NEW ENGLAND DX ASSOCIATION FOR THE
FOLLOWING DX INFORMATION.
```

TOGO AND BENIN. 5V7HL IS BEING VISITED BY KARL, K4YT, WHO WILL BE MOVING TO BENIN TO OPERATE AT TYA11 WITH N4HX. RECENT ACTIVITY HAS BEEN AT 21ØØZ ON 21275 KHZ. OTHER BENIN OPERATIONS PLANNED INCLUDE TY9ER BY GHIS, ON5NT, NEXT WEEK, 8Ø THRU 1Ø CW AND SSB, AND MAY 6 TO 13 BY DJ2BW AND DL8DC.

QATAR. A7XE IS AGAIN ACTIVE. WATCH 7ØØ4 AND 21Ø26 AFTER Ø2ØØZ. ALSO 15 METERS FROM 173ØZ. QSL DF4NW.

TOKELAU. REPORTS FROM ISRAEL SAY THAT ZM7AA SHOULD BE ACTIVE AT ANY TIME. ANTENNAS INCLUDE A 4Ø METER BEAM.

CEUTA. EA9EU HAS BEEN VERY ACTIVE ON 16Ø METERS. WATCH 1827 AFTER Ø43ØZ. QSL BOX 1Ø3, CEUTA, NORTH AFRICA.

SOUTH SHETLANDS. HFØPOL HAS BEEN ACTIVE ON 7ØØ1 FROM ØØ3ØZ. THIS IS A POLISH RESEARCH BASE ON KING GEORGE ISLAND. QSL SP5EKZ.

SOUTH SANDWICH. THE ONLY OPERATOR AT LU3ZY AT PRESENT CANNOT OPERATE CW. THE TUESDAY AND FRIDAY SCHEDULE HAS RESUMED ON 14212 AT Ø1ØØZ.

GUINEA. VK4NIC/3X WILL BE ACTIVE THROUGH THE END OF APRIL AND HAS BEEN ON 3795 AFTER Ø4ØØZ.

SOUTH GEORGIA. VP8SU HAS RETURNED TO ENGLAND BUT ANOTHER AMATEUR IS ON THE ISLAND AND WILL BE ACTIVE. GLORIOSO. FR7AI/G AS WELL AS FR7CE ON REUNION ARE ON 285Ø5 FROM 13ØØZ.

PALMYRA AND KINGMAN REEF. KB7NW AND ADØS HAVE LEFT HAWAII AND ARE DUE TO SIGN PORTABLE KH5 EARLY NEXT WEEK. AFTER FIVE DAYS ON PALMYRA THEY WILL MOVE TO KINGMAN REEF.

DODECANESE. K9QXY/SV5 HAS BEEN VERY ACTIVE, MOSTLY SSB.

GUINEA BISSAU. J5AG WILL BE LEAVING SATURDAY AR

THE NEXT DX BULLETIN IS SCHEDULED FOR APRIL 17 AT Ø2ØØ AND Ø5ØØ UTC.

FOOTNOTE TO THE 110 BAUD ASCII RTTY PRINTOUT FROM W1AW

The only changes we have made to the foregoing printout is change the 72 characters per line to 62, and add a carriage return between paragraphs, as this program does not decode line feeds. The receiver used was an ITT 3021A digitally tuned unit, the antenna a Hy-Gain 3 element Tri-Bander about 60 feet away from the ham shack with a homebrew 20 Meter preamp mounted on the antenna mast, the transmission line was 7/8ths inch diameter Heliax (tm) from Andrews Corp., the terminal unit was a Flesher TU-170 (straight out of the box and unmodified) and the interface to the TRS-80 a venerable Telesis VAR/80 (serial no. 0009) that has worked without fault for over 3 years. A special "thank-you" is due Western I/O for their faultless IBM Selectric terminal that printed it out.

CONCLUSION OF VOLUME 4

Chapters 1 through 10 were written during the fall/winter of 1980 and spring of 1981. By the time they are published, late summer 1981, 16 bit microprocessors such as the Z8000 will be proliferating....at least we hope so. Sometime late this year or early next year, Radio Shack will be announcing the Model IV TRS-80 16/32 bit machine. Let's hope they stick with Zilog who are certainly responsible in part for the astounding success of their Models I/II and their younger brother, the Model III.

Every time we believe we have a handle and a modest grasp on a given microprocessor, first Dr. Faggin's revolutionay 8080 and then his remarkable Z-80, the science, technology if you will, leap frogs another giant step forward forcing us to start all over again. Actually, we (and you too) would have it no other way. How very fortunate we are to live in this exciting time of fantastically rapid microprocessor development.

110 Baud ASCII radio teletype (100 words per minute) is over 50% faster than 60 speed Baudot RTTY (61 words per minute) and is coming "down the pike" whether the old time Baudot RTTYers like it or not. 300 Baud ASCII RTTY really flies along at 300 words per minute. Both 110 and 300 Baud ASCII radio teletype are the wave of the future and the future is tomorrow morning. In due course the Baudot RTTY machines will wear out, though we are definitely "not holding our breath" until that happens. Are we a polarized ASCII zealot? Of course not. The most sensible approach is to be able to work both Baudot and ASCII radio teletype and have the BEST of both possible worlds. That is why we have tried to give EQUAL time to both types of RTTY programs in Volume 4.

The differences between the amateur radio and computer buff are far less than we suspected. Both desire to communicate; ipso facto, the rash of computer bulletin board systems springing up daily. All it takes is a relatively inexpensive terminal unit and interface, plus a modest investment in ham gear and you are practically "on-the-air." Welcome to the "wonderful world of amateur radio's unlimited horizons."

Robert M. Richardson
Richcraft Engineering Ltd.
Drawer 1065, Wahmeda Industrial Park
Chautauqua, NY 14722 ■

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IMPACT PRINTER 165 CPS Serial and parallel interfaces-Eight Selectable character sizes-Single and double width characters-uses standard plain paper - same mechanism as the integral data syst... 1 year old $589, Sta... St., 250...

HEATHKIT H-11/DEC LSI-11 system, 32K Byte storage, reader 1 punch, video terminal, complete software. Cost $4500 assembled, $3500 kit. Like new. Sell for $2250. 305-962-6677. 2058 Griffin Rd., Ft. Lauderdale, FL 33312.

FOR SALE: Interdata (Perkin-Elmer) 7/16 Mini with 32KB core, front panel, 50A PWR supply. Includes HS tape reader, interfaces for LP, 2 (TTY), and RS-232 (Full duplex, programmable). Includes manuals and much SW (Basic, Fortran, OS, etc.,). $800 - After 6 P... (303)... 2035...

COMPUTER AUTOMATION ALPHA 16; 16 k-word core memory, RTC, PF-R. Modified Mod. ASR-33 TTY. Manuals, utilities, assemblers and many option boards - 16 bit I/O Driver, 16 bit I/O, Asynch modem contr. 64 bit output, 10 bit A/D - D/A. Fairly complete documentation. Up and running in Fortran. Not much more than TTY at $1000. **Herb Sauer, 303-494-8724.**

FOR SALE: Heath H9 video terminal, excellent condition, $175 or best offer. You ship. **[214] 962-4484**

WANTED: DIGITAL Group 32K memory board without memory chips and Phi deck controller board (kit, assembled or not working). W... 1510 NW 35th. T... 32...

PET COMPUTERS moving up to LSI-11. Pet business system priced to sell. PET 2001-16N Computer $800; 2040 Dual Floppy 340K (holds more data than 6 TRS-80 disks) $1,100. Digital cassettes (2) $60 each. System complete with Text Editor, disk sort, database software, real estate software and more $2,100. Call **PAUL** (313)971-8447

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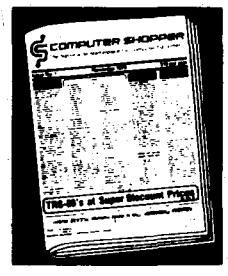

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QUESTIONS AND ANSWERS

Conducted by Hubert S. Howe, Jr.

QUESTION

from Kumphol Khaopravetch, 66-14 Woodside Avenue #302B, Woodside, NY 11377: I have been subscribing to *Computronics* almost a year, and now I have some problems I would like to ask you about. I have a TRS-80 Model I, Level II, 16K computer which uses the cassette tape unit. I would like to buy the printer and floppy disk system from the Heath Company, but I don't know what problems I will face when I interface them with the Radio Shack computer. I think I need to buy the following devices:

1. H-14 Line Printer
2. H-8-4 4-port RS-232C, Serial Interface
3. WH-8-41 Adapter Cable
4. HM-800 Manual for kits
5. HCS-1 Printer Paper
6. Any disk drive device from your suggestion.

Do I need any more devices except those that I mentioned above? I don't have an Expansion Interface. Do I need to buy it from Radio Shack before buying the devices above from Heath, or does Heath have a device that works similar to the Expansion Interface?

ANSWER

The Heath computer has a totally different architecture from the TRS-80. In general, I would *not* recommend that you try to use Heath peripherals with the TRS-80. The only possible exception to this would be the line printer, as long as you can get it with a parallel interface, so that you do not require any additional modifications to hook it up to your TRS-80. Also, make sure that the cable will work and that you can get one for the TRS-80.

If you want to get a TRS-80 disk drive, you *will* need an Expansion Interface. There are so many inexpensive disk drives now available on the market that this will certainly be the least expensive solution, but all of them will require that you first have an Expansion Interface.

Heath makes excellent quality products, especially for people interested in building kits; but if you want to use them, I would recommend that you buy the entire system, starting with the computer, from Heath. That will not only be expensive, it will also take many hours of labor to assemble.

QUESTION

from Theodore van Gelder, 1621 E. Mission Hills Road, Northbrook, IL 60062: I am ready and would like to add to my present system (Model I TRS-80 Level II), but I am confused by the advertising that I read concerning the equipment available.

The TRS-80 Expansion Interface lists for $559. There are others offered at $362. These are for the E. I. with 32K. Do all of these have the same attributes? What do they include and what is missing? *80-U.S. Journal* has an article (July/August 1981, page 21) that starts out with "a 16K Expansion Interface (Radio Shack only)". Is the Lobo E. I. (LK80) equivalent? How about Computer Plus equipment?

Disk drives: will all disk drives operate on all E. I.s? Are they able to produce the same results in the various combinations and arrangements of E. I. and disk drives?

Are printers are susceptible to variations depending on the E. I. used? Where can I find the answers to these questions and others that may arise?

ANSWER

First, you can find many different prices for Expansion Interfaces just by checking the various Radio Shack stores and authorized dealers. (You can also save money by buying used equipment.) As long as the equipment is manufactured by Radio Shack, it should all basically be the same (although Radio Shack itself has used different designs for the E. I.). Computer Plus, for example, is a Radio Shack dealer.

One of the most important reasons for the variations in price is the amount of memory in the interface. You can save the most money by buying a 0K interface and installing your own memory chips, which can cost under $20 for 16K now. This process voids the warranty, however. We really don't know enough about the Lobo or other non-Radio Shack expansion interfaces to know whether they are equivalent or not.

As far as disk drives are concerned, once you have a functioning Expansion Interface with the disk controller, any of the various drives advertised should work. Just make sure that you purchase a system drive for drive zero, or that instructions are included for switching the drive to the proper unit. (Most non-Radio Shack drives have switches allowing you to select whether it is a system drive or not.)

Line printers should *not* be susceptible to variations depending on the E. I. used. Here the problem is more likely to be the cable used, as Radio Shack's standard is slightly different from some others. If you mention that you will be using the printer on a TRS-80, most computer stores or salespeople will know what you need.

QUESTION

from The Bee Hive, 15 Olde Towne, Village Square Shopping Center, Hazelwood, MO 63042: We are interested in more capacity on our disk drives. We now have two RS drives and would like to add a TFD-100 in

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single density (for the present). We have TRSDOS 2.2. Can we just add on the TFD-100, or will we need a different DOS (such as NEWDOS) ? We would like to have a list of what we would need to make this system work, including prices, and another list assuming we just replace the two RS drives with two TFD-100's. This is a business application and we assume that we should use a data seperator.

ANSWER

You will need to purchase a new disk operating system whenever you add on disk drives that have more capacity than the standard Radio Shack 35-track (Shugart) drives. Most disk drives available now have 40 tracks, but the first 35 are compatible with the Shugart drives, so you lose only 5 tracks of data when running under a 35-track DOS like TRSDOS 2.2. Moving up to 80-track drives or to eight-inch disks involves many more substantial changes than from 35 to 40 tracks.

There are many new DOSs that support drives with greater capacity. NEWDOS40, the 40-track version of NEWDOS 2.1, will support 40-track drives. So will NEWDOS80 and DOS PLUS. DOS PLUS will support drives of different characteristics, but all must be the same. As far as we know, NEWDOS80 is the only DOS that presently supports different drives on the same system.

We would also recommend the Data Separator whether or not you move to new drives.

QUESTION

from Michael Silver, 3613 Purdue Drive, Bakersfield, CA 93306: Is there any way to modify the JKL function of NEWDOS to where it will print graphics as well as alphanumerics ? Is there any way to put MICRO-MOVIE on disk via LMOFFSET ? Can you please tell me the machine language code to move a 1K block of memory to video memory ?

ANSWER

Since the JKL function of NEWDOS goes through the standard line printer driver to print the contents of the screen, if your printer handles graphics with EXACTLY the same code as the video display, it should work. (Don't forget that bit 6 of the video RAM doesn't exist.) If it doesn't, you can patch in a line printer driver that does not do an AND 127 before sending each byte to the line printer.

I'm not familiar with MICRO-MOVIE, so I don't know why you can't save it on disk via LMOFFSET. I would suggest that you run LMOFFSET only to find out its starting, ending, and entry addresses. Then load the program into memory and use the U (unload) com-

mand in Monitor #3 or #4 or the DCV-1 program to move the program to unused RAM space, such as 7000H. Then save the resulting file on disk and try running that. If you are using NEWDOS, make sure that the program doesn't overwrite NEWDOS's keyboard driver at 4589H.

The code to move a 1K block of memory to video memory is as follows:

```
LD      HL,BLOCK        ;BLOCK TO MOVE
LD      DE,3C00H        ;UPPER LEFT CORNER

LD      BC,400H         ;1K IN HEX
LDIR                    ;MOVE BLOCK
```

QUESTION

from Michael Hough, P. O. Box 223, Faribault, MN 55021: I am the owner of a TRS-80 Model I, 48K computer with one disk drive, a line printer II and the lowercase modification. I have several questions:

1. Will the following programs run properly on my system: NEWDOS, NEWDOS+, NEWDOS/80, MON4, Adventure International Adventure programs.

2. When using the TAPEDISK utility program, it is necessary to enter the beginning, ending, and entry point memory addresses in order to transfer a system program from tape to disk. How can I find out what these memory addresses are for different programs? Is there an easier method for transferring programs from tape to disk?

3. What machine language programs (in terms of memory addresses) cannot be transferred to disk from tape and then be executed properly under DOS?

4. Can the following programs be transferred to disk and execute properly under DOS: Micro Chess, In Memory Information, Invasion Force, and T-BUG?

5. When powering up my system, or even while rebooting or resetting it, I am frequently receiving parity errors. This occurs when I try to load any program or when I try to get into Disk Basic from DOS. It does not always happen, but quite often. When this happens, I am forced to use the BACKUP utility program to make a useable diskette again. I have had the disk drive in for servicing where the heads were cleaned and aligned and the drive was checked for errors, and it was determined to be in good shape and returned to me. I am still having the same problem with the drive. I have tried using several diskettes, but the problem keeps recurring. This gets frustrating, because I MUST keep a backup of all my important programs in case this happens. What does a parity error mean? What can I do to prevent it? What might be causing it? Once it has happened, can it be corrected without making a completely new copy of the disk?

6. What is the difference between TRSDOS 2.1, TRSDOS 2.2, TRSDOS 2.3, VTOS 3.0, and NEWDOS 2.1?

7. Is NEWDOS 2.1 the same as NEWDOS, NEWDOS+, or NEWDOS/80?

8. What is VTOS 3.0, and what are its capabilities? Where can I obtain a copy?

9. Would the TRSDOS 2.3 manual be adequate documentation for the use of NEWDOS+?

ANSWER

1. NEWDOS, NEWDOS/80, MON4 and Adventure International programs will all run on your computer. NEWDOS+ is the same DOS as NEWDOS, only it comes with a batch of utility programs not included in NEWDOS alone.

2. The easiest way to find the starting, ending, and entry locations of programs in machine language is via the "L" command in MON4 if the program is on tape, or a program called LMOFFSET available with NEWDOS+ and NEWDOS/80 if on disk. You can also use the "C" command in MON4 to save programs on disk.

3. Machine language programs which load into RAM areas reserved for the disk operating system cannot be transferred to disk and then executed under DOS. Generally, the area to be avoided is from 4000H to 5200H (the bottom of low RAM to 20992). However, you can often use the "U" command in MON4 to get around this problem, provided that you do not use the disk for input and output.

4. I believe that Micro Chess uses the DOS RAM area, but I am not familiar with the others.

5. It sounds to me as if the disk parity errors you are getting could be caused by not opening the disk drive door when turning power on or off. The diskette must not be left in the drive when power is turned on; it can get "zapped". What happens is that the formatting of some system files gets lost, and then the system cannot be read properly so the computer doesn't work. When data is written to a diskette, a two-byte checksum is also written for every sector. If this does not match the checksum computed when the data is reread, the computer knows that the data was not properly read. You may also need to check the alignment of the disk drive (which must be done by a technician at a repair center), and it may help to install a Percom Data Separator, though this helps primarily on the inner tracks. Once this happens, the only practical alternative is to make another backup. Always make backups of important files!

6. TRSDOS versions 2.1, 2.2, and 2.3 are successive revisions of the disk operating system by Radio Shack. 2.2 and 2.3 are virtually identical. VTOS 3.0 now replaced by LDOS, and NEWDOS/80, are completely rewritten DOSs, as is DOS PLUS.

7. NEWDOS 2.1, which is the same as NEWDOS and NEWDOS+, is basically a revision of TRSDOS 2.1, with most of the bugs corrected and some nice new features added.

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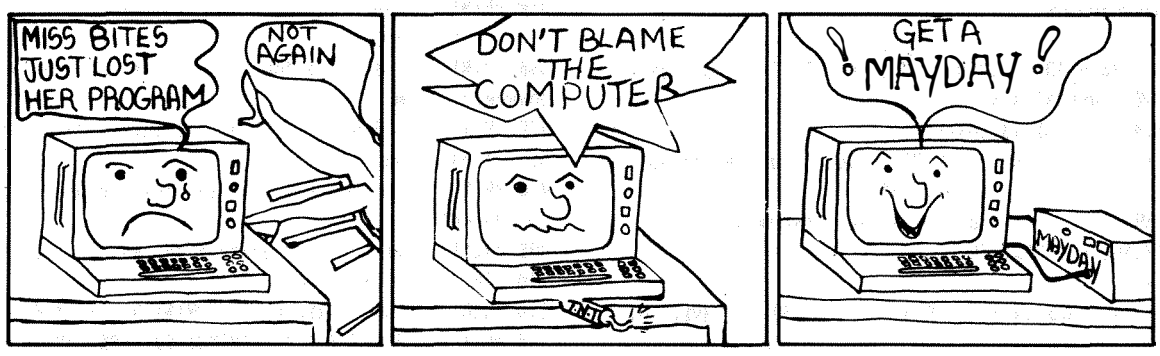

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8. VTOS 3.0 (now LDOS) is too much to explain here.

Computronics sells NEWDOS, NEWDOS/80, and DOS PLUS. LDOS can be obtained from Logical Systems, Inc., 11520 N. Port Washington Road, Mequon, WI 53092.

9. You would probably need the NEWDOS manual, although most questions are adequately answered in the TRSDOS manual.

QUESTION

from Richard J. Keenan, C.P.A., 2-11 So., Clifton Park, NY 10263: I have a TRS-80 Model I, but I have learned to program in assembly language by the use of Intel's 8080/8085 mnemonics with the 8080 extended mnemonics as found in the well-written book *Z-80 and 8080 Assembly Language Programming* by Kathe Spracklen. I am trying to find a macro assembler which will accept either just 8080 mnemonics or both the 8080 and Z-80 mnemonics (like the TRS-80 Model II Disk Assembler) which can be run on the Model I. Do you know of any?

ANSWER

Unfortunately, there is nothing for the TRS-80 that uses the mnemonics employed by Spracklen. If I'm not mistaken, these refer to the TDL Relocating Macro Assembler made by Xitan, which went out of business a few years ago.

If you want to program with 8080 mnemonics, then the best solution is to use CP/M. The standard version of CP/M comes with an 8080 Assembler, although not a macro assembler. There is a version of Microsoft's M80 macro assembler that runs under standard CP/M, but I'm not sure whether this is available for the Model I version of CP/M. There will soon be a version of Model III CP/M that is compatible with all the rest of the CP/M systems, made by Lifeboat Associates.■

continued from page 33

```
3370 RETURN
3380 CLS
3390 PRINT CHR$(23)"Program Terminated"
3400 END
3410 FOR T=1 TO 1000
3420 NEXT
3430 RETURN
3440 CLS
3450 PRINT"Text Buffer Clear ..."
3460 GOSUB 3410
3470 GOTO 180
3480 ' Convert Lower Case filenames to Upper Case
3490 FOR I=1 TO LEN(F$)
3500 IF ASC(MID$(F$, I, 1))>96
THEN MID$(F$, I, 1)=CHR$(ASC(MIO$(F$, I, 1))-32)
3510 NEXT
3520 RETURN
```

■

CORRECTION

The following program listing was inadvertently omitted from the November-December 1981 issue. It should be part of the SCREEN WRITER program by Joseph Rosenman.

```
1Ø REM VIDEO MASTHEAD PROGRAM "SCWRITER" VER 2.1, AUG 1981.
2Ø CLEAR 15ØØ : DEFINT A-K,M-V : DEFSTR W-Z
3Ø CLS : PRINT STRING$(63,CHR$(131))
4Ø PRINT @ 155,"SCWRITER"; : PRINT @ 216, "Video Masthead"
5Ø PRINT @ 278, "Generation Program" :
6Ø PRINT @ 399, "version 2.Ø, by Joseph Rosenman"
7Ø PRINT STRING$(63,CHR$(176))
8Ø FOR I=Ø TO 7
9Ø PRINT @ I*64, CHR$(149); : PRINT @ (I+1)*64-1, CHR$(17Ø);
: NEXT I
1ØØ PRINT @ 974, "Please wait for initialization . . .";
11Ø DIM D(1Ø24), S(28), A(4) , B(1)
12Ø FOR I=Ø TO 1Ø23 : D(I)=32 : NEXT I : ' FILL WITH BLANKS.
13Ø FOR I=Ø TO 28 : READ S(I) : NEXT I : ' GET MACHINE CODE.
14Ø K=64 : V=1536Ø : Z=STRING$(63,14Ø) : B(1)=4Ø96 : B(Ø)=256
15Ø Z1=CHR$(1)+CHR$(66) : L2=25 : W2=CHR$(24)
16Ø REM
17Ø REM          INITIALIZATION COMPLETE
18Ø REM
19Ø GOSUB 31Ø : ' INSTRUCTIONS
2ØØ CLS : GOSUB 55Ø : ' DATA ENTRY ROUTINE
21Ø CLS : GOSUB 76Ø : ' DATA PROCESS ROUTINE
22Ø CLS : GOSUB 88Ø : ' SCREEN PRINT ROUTINE
23Ø CLS : GOSUB 98Ø : ' DISK WRITE ROUTINE
24Ø REM
25Ø PRINT : PRINT "Load Module created and saved,"
26Ø PRINT "RUN COMPLETED."
27Ø END
28Ø REM
29Ø REM          INSTRUCTIONS ROUTINE   * * *
3ØØ REM
31Ø PRINT @ 969, "Type  <I>  for Instructions,  <C> to
Continue";
32Ø PRINT @ 86Ø, CHR$(183)+"   "+CHR$(187);
33Ø PRINT @ 862, "?"; : FOR I=1 TO 6Ø : NEXT I
34Ø W1=INKEY$ : IF W1 = "C" RETURN ELSE IF W1 = "I" GOTO 36Ø
35Ø PRINT @ 862, " "; : FOR I=1 TO 2Ø : NEXT I : GOTO 33Ø
36Ø CLS : PRINT STRING$(64,CHR$(143));
37Ø PRINT "  The  SCWRITER  program  allows the  user to
create a screen"
38Ø PRINT "  image  via  BASIC PRINT  statements,  then store
 that image"
39Ø PRINT "  in a format  where a  machine language program
can  (nearly)"
4ØØ PRINT "  instantly  display  it  on  the  CRT.   You  must
format the"
41Ø PRINT "  PRINT  statements  in  this  program  at line
 145Ø.   After"
42Ø PRINT "  the  screen  image  appears  correct,  the
 program  will"
43Ø PRINT "  generate  a Load Module  ( a /CMD file)  that
 will  display"
44Ø PRINT "  the  previously  stored  image  from the  DOS.
  The program"
45Ø PRINT "  can  handle  a  screen  between 1  and  14
lines  in  size."
46Ø PRINT "  The  Load Module  can  be  set  to  originate
anywhere  from"
47Ø PRINT "  52ØØH  to  FØØØH.   Origin address  can be
specified either"
48Ø PRINT "  in  Decimal  or  in  Hexadecimal.   The  module
 produced"
49Ø PRINT "  will be  1  granule or less in size."
5ØØ FOR I=1 TO 14
51Ø PRINT @ I*64, CHR$(149); : PRINT @ (I+1)*64-1, CHR$(17Ø);
52Ø NEXT I : PRINT @ 96Ø, STRING$(63,CHR$(188));
53Ø PRINT @ 9Ø8, "Type  <ENTER> when ready to continue";
54Ø W1=INKEY$ : IF W1 = CHR$(13) RETURN ELSE PRINT W2; :
GOTO 54Ø
55Ø REM
56Ø REM          DATA ENTRY ROUTINE   * * *
57Ø REM
58Ø PRINT Z
59Ø INPUT "How many lines of text do you wish to define"; T
6ØØ IF T > 14 PRINT "Maximum of 14 lines possible." : GOTO
59Ø
61Ø IF T < 1 PRINT "What's that you say?" : GOTO 59Ø
62Ø PRINT : PRINT Z
63Ø LINE INPUT "What is the filespec for the Load Module?
"; W
64Ø PRINT : PRINT Z
65Ø INPUT "Where should the file load to  (Default =
7ØØØH)"; X
66Ø IF LEN(X) > 5 PRINT "* * *   Error, greater then 5" :
GOTO 65Ø
67Ø CLS : PRINT Z : PRINT
68Ø PRINT "In a few moments, the screen will display the
pattern you"
69Ø PRINT "entered in the prints edited into this program.
 If you wish"
7ØØ PRINT "to save the image as an object module, type any
key except"
71Ø PRINT "'X'.  If you want to abort the run, type 'X'."
72Ø PRINT : PRINT Z : PRINT
73Ø PRINT TAB(2Ø) "Type  <ENTER>  to continue"
74Ø WW=INKEY$ : IF WW = "" GOTO 74Ø
75Ø RETURN
76Ø REM
77Ø REM          DATA PROCESS ROUTINE  * * *
78Ø REM
79Ø REM DETERMINE CORRECT ADDRESS, AND UPDATE "S" ARRAY.
8ØØ Q=1536Ø+T*K : Q1=Q/256 : T2=T*64
81Ø S(22)=Q1 : S(25)=Q-Q1*256
82Ø IF MID$(X,5,1) = "H" GOSUB 119Ø ELSE L=VAL(X)
83Ø IF L <= Ø THEN L=28672 : GOTO 86Ø
84Ø M=L/256 : S(3)=M : S(2)=L-M*256 : ' LOAD ADDR
85Ø L1=L+25 : M=L1/256 : S(9)=M : S(8)=L1-M*256
```

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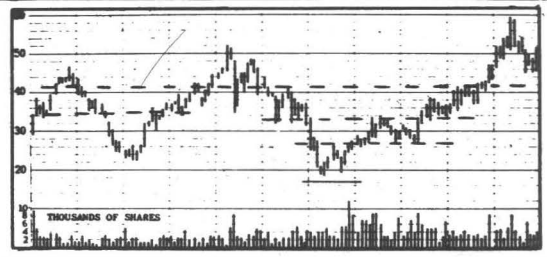

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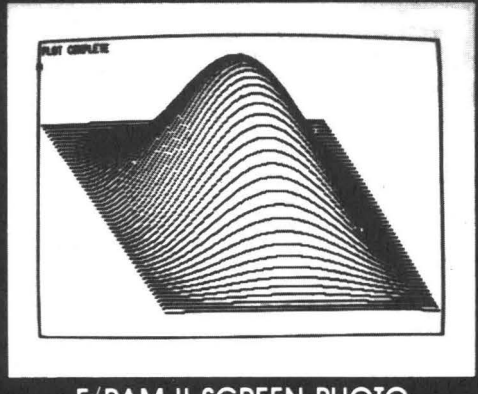

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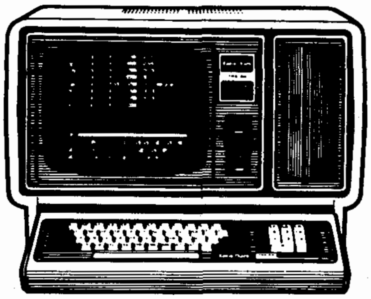

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```
860 L2=L2+L : Q1=T2/255 : S(15)=Q1 : S(14)=T2-Q1*255
870 RETURN
880 REM
890 REM         SCREEN PRINT ROUTINE  * * *
900 REM
910 GOSUB 1330 : ' DISPLAY THE USER PRINTS.
920 PRINT @ 962, "Type  <X> to abort or any other key to
proceed.";
930 WW=INKEY$ : IF WW = "" GOTO 930 ELSE IF WW = "X" STOP
940 PRINT @ 962, "Screen image extraction beginning --";
950 PRINT @ 998, " Now reading byte # ";
960 FOR I=1 TO T2 : D(I)=PEEK(15359+I) : PRINT @ 1015, I; :
NEXT I
970 CLS : RETURN : ' SCREEN IMAGE SAVED IN D ARRAY.
980 REM
990 REM         DISK WRITE ROUTINE  * * *
1000 REM
1010 PRINT @ 15, "* * *   S C W R I T E R   * * *"
1020 PRINT @ 128, "Screen image saved, Disk encoding
beginning. . ."
1030 Y="" : FOR I=0 TO 28 : Y=Y+CHR$(S(I)) : NEXT I
1040 OPEN "O",1,W
1050 PRINT#1, Y; : PRINT
1060 PRINT "Machine Language routine written,"
1070 PRINT "Screen image Format and Write beginning."
1080 PRINT @ 448, "Now writing line #";
1090 FOR I=0 TO T : GOSUB 1290 : PRINT @ 468, I; : PRINT#1,
Z1;Z2;
1100 FOR J=1 TO 64 : PRINT#1, CHR$(D(K*I+J));
1110 NEXT J : L2=L2+64 : NEXT I : PRINT @ 512, "Writing
END-OF-FILE"
1120 PRINT#1, CHR$(2)+CHR$(2)+CHR$(S(2))+CHR$(S(3));
1130 CLOSE 1 : ' FILE WRITE COMPLETED.
1140 RETURN
1150 REM
1160 REM        MISC. ROUTINES   * * *
1170 REM
1180 REM * * *   ASCII HEX TO INTEGER DECIMAL CONVERSION.
1190 X=LEFT$(X,4) : J=LEN(X)
1200 IF J > 3 THEN A(4)=ASC(MID$(X,1,1))-48 : X=RIGHT$(X,3)
1210 IF J > 2 THEN A(3)=ASC(MID$(X,1,1))-48 : X=RIGHT$(X,2)
1220 IF J > 1 THEN A(2)=ASC(MID$(X,1,1))-48 : X=RIGHT$(X,1)
1230 A(1)=ASC(X)-48
1240 FOR I=1 TO 4 : IF A(I) > 9 THEN A(I)=A(I)-7
1250 NEXT I
1260 L=A(4)*B(1)+A(3)*B(0)+A(2)*16+A(1)
1270 RETURN
1280 REM * * *   PACK CURRENT ADDRESS FROM C INTO Z2
1290 Q1=L2/256 : Q=L2-Q1*256 : Z2=CHR$(Q)+CHR$(Q1) : RETURN
1300 REM
1310 DATA 1,27,0,112,205,201,1,33,25,112,17,0,60,1,
0,2,237,176
1320 DATA 33,33,64,54,62,43,54,0,195,45,64
1330 REM
1340 REM        USER PRINTS    * * *
1350 REM
1360 '
1370 ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '
1380 ' THE FOLLOWING SECTION SHOULD BE CUSTOM PREPARED BY THE '
1390 ' USER.  PREPARE ANY PRINT STATEMENTS DESIRED. THE TOTAL '
1400 ' NUMBER OF LINES SHOULD BE NOTED, AS YOU WILL NEED TO   '
1410 ' GIVE THE PROGRAM THAT NUMBER DURING EXECUTION.         '
1420 ' MAXIMUM OF UP TO 15 LINES OF TEXT MAY BE ENCODED.      '
1430 ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '
1440 '
1450 PRINT CHR$(191); STRING$(62,CHR$(143)); CHR$(191);
1460 PRINT CHR$(191);"  * * *   Welcome to NEWDOS80  Disk
Operating System  * * *   ";CHR$(191);
1470 PRINT CHR$(191);"  on the TRS-80  Z80 based
microcomputer.  This installation  ";CHR$(191);
1480 PRINT CHR$(191);"  features   48K RAM,   Lower Case,
2)  40 track disks,     ";CHR$(191);
1490 PRINT CHR$(191); STRING$(18," "); "and Epson  MX-80
Printer.";STRING$(19," "); CHR$(191);
1500 PRINT CHR$(191); STRING$(62," "); CHR$(191);
1510 PRINT CHR$(191); STRING$(13," "); "General System DOS
 Diskette Loaded" STRING$(14," "); ;CHR$(191);
1520 PRINT CHR$(191); STRING$(62,CHR$(188)); CHR$(191);
1530 ' END OF USER PRINTS
1540 RETURN
1550 END
```

™TRS80 color

From the January 1981 issue of the CSRA Computer Club newsletter:

There was some amusement at the November meeting when the Radio Shack representatives stated that the software in the ROM cartridges could not be copied. This month's 68 Micro Journal reported they had disassembled the programs on ROM by covering some of the connector pins with tape. They promise details next month. Never tell a hobbyist something can't be done! This magazine seems to be the only source so far of technical informations on the TRS-80 color computer™. Devoted to SS-50 6800 and 6809 machines up to now, 68 Micro Journal plans to include the TRS-80 6809 unit in future issues.

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HOW ACCEL2 WORKS, PART 2

TRS-80 Model I/III BASIC Compiler

The ACCEL2 program has worked fine! I used it to compile a BASIC WORD PROCESSOR that was published in 80 MICROCOMPUTING in their MAY 1980 issue. It was necessary to go through all of the for-next loops because of the many jumps out of them and make corrections.but when that job was done the program worked fine. I am using it to write you this letter. The final program fits into a 32K machine.

ACCEL2 is amazing! I had bought an Othello game a couple of years ago, but never played it because of the interminably long time (2-3 minutes) it took the computer to make each move - no fun at all. Just for the heck of it I ran ACCEL2 on it, making NO changes whatsoever to the program, and the whole thing compiled at once with no tinkering! It then took about 10 seconds per move, so I added a single statement at the beginning to DEFINT A-Z, recompiled, and the result is just as good as an assembly-language program - only a couple of seconds per move!

I also wish to state that I think that ACCEL2 is an excellent product. I have modified Scott Adams' Backgammon game to compile under ACCEL2 as an example. The original BASIC program takes 30 to 40 seconds for the average move and can take as much as 4 minutes. The compiled version averages 2 to 3 seconds per move with a maximum move time of 9 seconds (all integer variables). That is significant!!

I'VE BEEN PLAYING WITH ACCEL2 FOR A FEW HOURS NOW AND IT SEEMS TO BE PRETTY GOOD. FOR EXAMPLE, MY LEVEL 2 VERSION OF RADIO SHACK'S CHECKERS GAME DRAWS THE BOARD IN 19 SECONDS AND MAKES THE SECOND MOVE IN 11 SECONDS. THE COMPILED VERSION DRAWS THE BOARD IN 11 SECONDS AND MOVES IN UNDER 1 SECOND (ABOUT 0.5). A PROGRAM TO GRAPH CUBIC EQUATIONS TOOK 6 SECONDS PER PLOT, WHILE THE COMPILED COPY TAKES LESS THAN 2.

I HAVE COMPILED ONE PROGRAM I USE RATHER FREQUENTLY: IT EXTRACTS INFORMATION FROM A LARGE DISK FILE (1720 64-BYTE RECORDS PER DISK) AND PRODUCES A REPORT. THE INTERPRETED VERSION OCCUPIES ABOUT 4600 BYTES AND TAKES 18 MIN TO EXTRACT INFORMATION FROM ONE DISK. THE COMPILED VERSION TAKES JUST OVER 3 MIN TO PERFORM THE SAME TASK. SINCE A TYPICAL REPORT INVOLVES ANYWHERE FROM 5 TO 25 DISKS, THIS [illegible]

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HELPFUL HINTS

REVISED SYMBOL TABLE

When I wrote the SYMBOL TABLE program which appeared in the October 1981 issue, I had a 16K cassette system. Since that time I have expanded my computer to a 48K disk system. One of the first problems that occurred after the expansion was that SYMTAB didn't work on large programs due to the fact that BASIC handles large addresses as negative numbers.

The following is a revised version of SYMBOL TABLE which works on 32K and 48K systems.

```
65ØØØ CLS : PRINT"SYMBOL TABLE PROGRAM"
65ØØ2 INPUT "ENTER Ø FOR VIDEO OR 1 FOR PRINTER";Q9%
65ØØ4 IF Q9%<>0 AND Q9%<>1 THEN 65ØØ2
65ØØ6 IF Q9%=1 THEN POKE 16427,62: LPRINT : LPRINT TAB(22);
"SYMBOL TABLE": LPRINT : GOTO 65Ø2Ø
65Ø1Ø CLS: POKE 16916,2: PRINT @22, "SYMBOL TABLE": PRINT
65Ø2Ø Q4%=Ø: Q5%=Ø: Q6%=Ø: Q7%=16633: Q4!=Ø: Q5!=Ø: Q8%=Ø
65Ø3Ø Q8!=PEEK(Q7%)+PEEK(Q7%+1)*256
65Ø4Ø Q9!=PEEK(Q7%+2)+PEEK(Q7%+3)*256
65Ø5Ø IF Q8!=Q9! THEN 6511Ø
65Ø51 GOSUB 6551Ø
65Ø52 IF  PEEK(Q8%+1)>51 AND PEEK(Q8%+1)<58 AND PEEK(Q8%+2)=81
THEN Q8!=Q8!+3+PEEK(Q8%) : GOTO 65Ø5Ø
65Ø55 Q6%=Q6%+1
65Ø57 GOSUB 655ØØ
65Ø6Ø POKE 1654Ø,Q9%: PRINT CHR$(PEEK(Q8%+2)); CHR$(PEEK(Q8%+1)),
65Ø65 POKE 1654Ø,Q9%
65Ø7Ø IF PEEK(Q8%)=2 THEN PRINT "INTEGER",: Q8!=Q8!+5: GOTO 65Ø5Ø
65Ø8Ø IF PEEK(Q8%)=3 THEN PRINT "STRING",: Q8!=Q8!+6: GOTO 65Ø5Ø
65Ø9Ø IF PEEK(Q8%)=4 THEN PRINT "SINGLE",: Q8!=Q8!+7: GOTO 65Ø5Ø
651ØØ PRINT "DOUBLE",: Q8!=Q8!+11: GOTO 65Ø5Ø
6511Ø Q6%=Q6%+1: GOSUB 655ØØ: PRINT"END OF SYMBOLS"
65118 Q6%=9Ø: GOSUB 655ØØ
6512Ø IF Q9%=Ø THEN CLS: Q6%=Ø: PRINT @2Ø,"ARRAY TABLE     ":
ELSE LPRINT : LPRINT TAB(14),"ARRAY TABLE": LPRINT
65121 POKE 1654Ø,Q9%
65122 PRINT "SY";TAB(4);"TYPE";TAB(15);"DIM";TAB(23);"RANGES"
6513Ø Q9!=PEEK(Q7%+4)+PEEK(Q7%+5)*256
6514Ø IF Q8!=Q9! THEN PRINT "END OF ARRAYS": POKE 16916,Ø: END
65145 GOSUB 6551Ø
6515Ø Q6%=Q6%+2: GOSUB 655ØØ
65155 POKE 1654Ø,Q9%
6516Ø PRINT CHR$(PEEK(Q8%+2));CHR$(PEEK(Q8%+1));TAB(4);
65165 POKE 1654Ø,Q9%
6517Ø IF PEEK(Q8%)=2 THEN PRINT "INTEGER";: GOSUB 654ØØ:
GOTO 6514Ø
6518Ø IF PEEK(Q8%)=3 THEN PRINT"STRING";: GOSUB 654ØØ:
GOTO 6514Ø
6519Ø IF PEEK(Q8%)=4 THEN PRINT "SINGLE";: GOSUB 654ØØ:
GOTO 6514Ø
652ØØ PRINT "DOUBLE";: GOSUB 654ØØ: GOTO 6514Ø
654ØØ Q5%=PEEK(Q8%+5)
654Ø5 POKE 1654Ø,Q9%
6541Ø PRINT TAB(15);Q5%;TAB(23)
65412 Q4!=Q8!
65415 IF Q5%=1 THEN 65436
6542Ø FOR Q4%=Q5%-1 TO 1 STEP -1
65424 Q8!=Q4!+6+2*Q4%: GOSUB 6551Ø
65426 Q5!=PEEK(Q8%)
65428 Q8!=Q4!+7+2*Q4%: GOSUB 6551Ø
6543Ø Q5!=Q5!+ PEEK(Q8%)*256-1
65432 POKE 1654Ø,Q9%: PRINT " Ø -";Q5!;",";
65434 NEXT
65436 Q8!=Q4!+6+2*Q4%: GOSUB 6551Ø
65438 Q5!=PEEK(Q8%)
6544Ø Q8!=Q4!+7+2*Q4%: GOSUB 6551Ø
65442 Q5!=Q5!+ PEEK(Q8%)*256-1
65444 POKE 1654Ø,Q9%: PRINT " Ø -";Q5!
```


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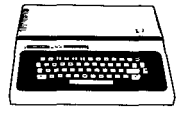

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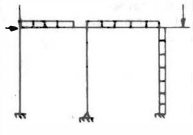

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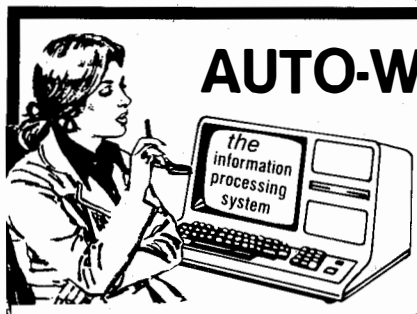

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```
65446 Q8!=Q4!+3: GOSUB 65510
65448 Q5!=Q4!+ PEEK(Q8%)
65450 Q8!=Q4!+4: GOSUB 65510
65452 Q8!=Q5!+5+256*PEEK(Q8%)
65460 RETURN
65500 IF Q9%=0 AND Q6%>26 AND INKEY$="" THEN 65500: ELSE RETURN
65510 IF Q8!<=32767 THEN Q8%=Q8! ELSE Q8%=Q8!-65536
65512 RETURN
```

(Thanks to Kenneth R. Meyer, 1314 Ault View Avenue, Cincinnati, Ohio 45208.) ■

This'll Fix 'Em

Do you know any good POKEs? For instance, I know one to turn off the video, so that nothing can be put on the screen unless POKEd. This is what to do: POKE 16414,0 to turn it off, and POKE 16414,88 to turn it back on. When it is off, if you want to print something, you need to POKE it, such as in the following line:
10 FOR I=15360 TO 16383 : POKE I,191 : NEXT I
I know a lot of POKEs like this; however, I'm sure that I don't know half of the ones that there are. I know a lot of "hungry" TRS-80 owners who would love to have a list of them.

(Thanks to Michael Silver, H. Silver and Associates, 5959 West Century Blvd., Suite 1010, Los Angeles, CA 90045.)

Problem in "BIORHYTHMS"

I was very interested in the "Biorhythms" program by Frank L. Growney, published in the May 1981 issue. After execution, I noticed something different from other Biorhythm cycles. Using my daughter's birthday of 10,29,1965 and a starting date of the same date, the curves looked very good except that the original direction was negative. It is my understanding that biorhythm cycles start in the positive direction.

A modification of program line 920 to the following:

F=INT(-10*SIN(6.28318 . . . . etc.

produced the positive curves.

(Thanks to Donald L. Abend, 9217 Washburn Road, Apartment 29, Downey, CA 90242.)

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Program also carries out computations for depreciation schedules, joint vs. separate returns, itemized vs. standard deductions, depreciation vs. tax credits, etc., in order to help make important tax decisions. Includes 1981 Tax law changes, references to related areas such as gift and inheritance taxes, trusts, estates, partnerships, corporations, pension and retirement plans, tax-exempt organizations, etc. Includes booklet of useful IRS tax forms, other tax publications, and toll-free phone number of tax attorney. Available on cassette or diskettes for most popular micros. Price $49.95

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A CORRESPONDENCE TIMESAVER

Nadine Willems

This little program is for anyone who resents repetitive chores that keep you from working (playing) at your TRS-80.

The program will print out mailing labels for any envelope that you have to type out frequently during the year. I generally print out 12 of each label, but in some cases I will print out 54 or more. (My labels come in segments of six, single width.) The best results are obtained using a maximum of 4 print lines, and feed 2. With this program I very seldom have to write or type out an envelope!!

Envelopes will look more attractive and personal if you make use of the lower case, and use 12 pitch if you have it. At Christmas, a red ribbon instead of black; use as many personal touches as possible. And of course, you can print out your own return labels.

One word of warning, depending upon your driver, BE SURE THAT FORM FEED IS POKED AT ZERO.

```
5 CLS : X=Ø : CLEAR 25Ø : PRINT          '** Label counter
1Ø INPUT "HOW MANY LABELS";K
2Ø INPUT "LOWER CASE ACTIVE";X$:         '** If you have
3Ø INPUT "NAME";N$                       '   l/c, USE it
4Ø INPUT "STREET ADDRESS";A$
5Ø INPUT "CITY & PROVINCE (NO COMMAS)";C$ '** I'm Canadian
6Ø INPUT "COUNTRY & POSTAL CODE";P$
7Ø CLS : PRINT : PRINT "HAVE FIRST LABEL ON LINE 1"
8Ø PRINT : INPUT "ENTER WHEN READY";X$
9Ø LPRINT N$ : LPRINT A$ : LPRINT C$
1ØØ IF  P$ = "" LPRINT : GOTO 12Ø        '** Keeps 6 lines
11Ø LPRINT  P$
12Ø LPRINT : LPRINT : X=X+1 :            '** Label to Line 1
13Ø IF X < K GOTO 9Ø
14Ø CLS : PRINT : PRINT "ANOTHER SET? Y/N"
15Ø X$=INKEY$ : IF X$ = "" GOTO 15Ø      '** Level 1 INPUT
16Ø IF X$ = "Y" GOTO 1Ø
17Ø IF X$ <> "Y" AND X$ <> "N" GOTO 14Ø
18Ø END
```

The above program could be easily expanded to maintain a Data File. It would depend on the number of names required. I find it is simpler to type out a list and keep it near my computer.

PENCIL can be used, but I prefer the BASIC for printing out multiple copies. I do use PENCIL for my Christmas Card list—once it's done, it's done, except for a few alterations each year.

Nadine Willems
Bonabec Acres
R. R. 4 Barrie, Ontario
Canada L4M 4S6

■

I III

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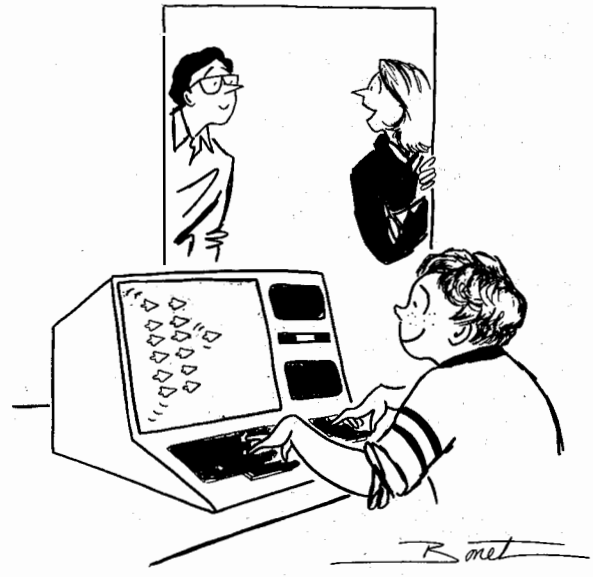

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Form **1040** Department of the Treasury—Internal Revenue Service **U.S. Individual Income Tax Return** **1981**

For Privacy Act Notice, see page 3 of Instructions | For the year January 1–December 31, 1979, or other tax year beginning 1979, ending , 19

Use IRS label. Otherwise, please print or type.	Your first name and initial (if joint return, also give spouse's name and initial)	Last name	Your social security number
	Present home address (Number and street, including apartment number, or rural route)		Spouse's social security no.
	City, town or post office, State and ZIP code		Your occupation ▶ Spouse's occupation ▶

Presidential Election Campaign Fund ▶ Do you want $1 to go to this fund? . . . . . Yes No

If joint return, does your spouse want $1 to go to this fund? . . . Yes No

Note: *Checking "Yes" will not increase your tax or reduce your refund.*

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- FORM 2210 UNDERPAYMENT OF ESTIMATED TAX BY INDIVIDUALS
- FORM 2440 DISABILITY INCOME EXCLUSION
- FORM 2441 CREDIT FOR CHILD AND DEPENDENT CARE EXPENSES
- FORM 3903 MOVING EXPENSE ADJUSTMENT
- FORM 4797 SUPPLEMENTAL SCHEDULE OF GAINS AND LOSSES

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- SCHEDULE F - FARM INCOME AND EXPENSES
- SCHEDULE G INCOME AVERAGING
- SCHEDULES R & RP-CREDIT FOR THE ELDERLY
- SCHEDULE SE-COMPUTATION OF SOCIAL SECURITY SELF-EMPLOYMENT TAX
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GENERAL LEDGER

rocesses

- ★ Flexible design allows system to be easily adapted to both small businesses and also to firms performing client writeup services.
- ★ Add, change or delete records within the Chart of Accounts (Master) File.
- ★ List the Chart of Accounts File.
- ★ Key in transactions into the Transactions (Journal Entries) File.
- ★ List the Transactions File.
- ★ If other Peachtree Software packages are present, pass summary transactions from these packages to the General Ledger at the end of the accounting period.
- ★ At the end of an accounting period, print out the major reports:
  - (1) Trial Balance (Detail Report)
  - (2) Transaction Registers
  - (3) Balance Sheet
  - (4) Prior Year Comparative Balance Sheet
  - (5) Income Statement
  - (6) Prior Year Comparative Income Statement
  - (7) Department Income Statements

le Information

There are two main computer files maintained within the General Ledger ystem.

(1) The of Accounts File
- Account Number
- Description
- Account Type
- Balance Sheet Column Code
- Current Amount
- Year-To-Date Amount
- Budget Amount
- Prior Year Monthly Amounts

(2) The Transactions File
- Account Number
- Description
- Source Code
- Reference
- Date
- Amount

ACCOUNTS RECEIVABLE

Processes

- ★ Add, change or delete records within the Customer File.
- ★ List the entire Customer File, or any Customer within the File.
- ★ Enter invoices, payments, credits and adjustments.
- ★ Prepare invoices and statements.
- ★ Produce the following reports:
  - (1) Aged Accounts Receivable
  - (2) Invoice Register
  - (3) Payment, Credit and Adjustment Register
  - (4) Customer Account Status Report
- ★ At the end of a month, post the following items to the General Ledger:
  - (1) Invoiced Sales
  - (2) Freight Charges
  - (3) Sales Tax
  - (4) Service Charge Income
  - (5) Cash Payments
  - (6) Discounts Allowed
  - (7) Returns/Credits
  - (8) Income Adjustments
  - (9) Accounts Receivable

File Information

There are three main computer files maintained within the Accounts Receivable System, the Customer File, the Invoice File, and the Transaction File.

CUSTOMER FILE
- Customer Account Number
- Customer Name
- Address
- Phone
- Type of Account
- Credit Terms
- Credit Limit
- Tax Rate
- Discount Rate
- Date of Last Credit
- Date of Last Debit
- Amount of Last Credit
- Amount of Last Debit
- Current Balance
- High Balance
- Year-To-Date Sales
- Year-To-Date Payments
- Automatic Billing Amount

INVOICE FILE
- Invoice Number
- Invoice Date
- Invoice Amount
- Credit Terms

TRANSACTION FILE
- Transaction Type
- Transaction Date
- Transaction Amount

ACCOUNTS PAYABLE

Processes

- ★ Add, change or delete records within the Vendor File.
- ★ List the Vendor File.
- ★ Enter vouchers.
- ★ Automatically determine which vouchers to pay.
- ★ Print checks and a Check Register.
- ★ Produce the following reports:
  - (1) Open Voucher Report.
  - (2) Accounts Payable Ageing Report.
  - (3) Cash Requirements.
- ★ At the end of a month, prepare the General Ledger Transfer File, passing the following information for each debit or credit transaction:
  - (1) Account Number
  - (2) Description
  - (3) Source Code
  - (4) Date
  - (5) Amount

File Information

There are two main computer files maintained within the Accounts Payable System, the Vendor File and the Voucher File.

VENDOR FILE
- Vendor Code
- Vendor Name
- Address
- Phone
- Year-To-Date Purchases
- Year-To-Date Payments
- Current Balance
- Last Payment
- Date of Last Payment
- Monthly Entry Flag
- Due Date of Month
- Debit Account Number
- Amount (Debit)
- Month Last Paid

This file may also contain information to enable generation of automatic vouchers for those items such as rent or bank payments that are paid every month.

VOUCHER FILE
- Voucher Code
- Voucher Date
- Amount Due
- Date Due
- Discount Percent
- Discount Amount
- Discount Date
- Invoice Number
- Invoice Date
- Status

Plus up to six account number-amount fields for General Ledger account numbers to which the amount due is to be distributed.

PAYROLL

Processes

- ★ Add, change or delete records within the Employee File.
- ★ List the Employee File.
- ★ Modify the Tax Information Files.
- ★ At the end of a pay period -
  - (1) Calculate Pay
  - (2) Print Checks
  - (3) Print Payroll Register
- ★ At the end of a month -
  - (1) Print the monthly summary
  - (2) Print the Unemployment Tax Report
  - (3) Prepare the General Ledger Transfer File, passing the following information:
    - Net Pay (Cash)
    - Employee FICA Withheld
    - Federal Tax Withheld
    - Insurance Deductions
    - Miscellaneous Dedutions
    - State Tax Withheld
    - Local Tax Withheld

  The gross pay for up to twenty payroll departments may also be passed to the General Ledger.
- ★ At the end of a quarter, print the 941A report information.
- ★ At the end of a year, print the W-2 forms.

File Information

There are two main computer files maintained within the Payroll System, the Employee Master File and the Tax File.

EMPLOYEE MASTER FILE
- Name
- Address
- Local Code
- State Code
- Marital Status
- Exemptions, Federal
- Exemptions, State
- Social Security Number
- Pay Period
- Pay Type
- Pay Rate
- Insurance Deduction
- Miscellaneous Deduction
- Date Employed
- Date Terminated
- Last Check Information

Payroll (con't)

And current, month-to-date, quarter-to-date and year-to-date totals for:
- Regular Earnings
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- Other Hours Rate/Earnings
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- Federal Deductions
- State Deductions
- Local Deductions
- Insurance Deductions
- Miscellaneous Deductions

TAX FILE
(for single and married persons)
- Federal Tax Information Tables
- State Tax Information Tables
- Local Withholding Tax Information Tables

An Overview of the Inventory System

Inventory is probably the most speculative of all of a company's assets. A true measure of the effectiveness of management is the ability with which it supervises the inventory control function.

The Peachtree Software™ Inventory Management System is designed to (1) give you better merchandise control, (2) allow you to lower your dollar investment in inventory, and (3) improve customer service and response.

The System maintains detailed information on each inventory item including the part number, description, unit of measure, vendor and reorder data, item activity, and complete information on current item costs, pricing, and sales. Transactions effecting inventory (sales, receipts, adjustments) may be applied at any time to insure the inventory data is always up to date and accurate.

As with all Peachtree products, the system is interactive, simple to operate, and provides reports that are up to date and comprehensive.

Particular features of the Peachtree Software™ Inventory Management System include:

- Interactive, menu-driven programs
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- Long item number - up to 15 characters
- Departmentalizing of items
- Multiple pricing levels
- Processes items on reserve (committed but still in stock)
- Online item query at any time
- Comprehensive management reporting
- Automatic month end file backup
- Recovery routines for hardware failures
- Sample data for demonstration and training

How the System is Designed

The Inventory Management System operates with an **Inventory Master File** which allows for the creation of each inventory item and for the recording of transactions (sales, receipts, returns, reserves, and adjustments) to each inventory item.

The Inventory Master File contains the item number, description and various other data on item costs, prices, reorder levels, vendor refereence, and activity. The items within the Master File are entered, changed, deleted, and queried through the **Inventory Master File Maintenance** program. All data on all items may be listed by using the **Detail Inventory Report** program.

Transactions may be applied at any time to the Master File through the **Enter Inventory Transactions** program. An **Update Report** automatically prints during this entry process to provide an audit trail of all inventory acitivity.

Several reports are available for the maintaining of stock, analysis, and forecasting. These reports include the **Physical Inventory Worksheet, Inventory Price List, Departmental Summary Report, Inventory Status Report,** the **Reorder Report** and the **Period-to-Date** and **Year-to-Date** reports.

At the end of an accounting period (usually a month), and then again at the end of a year, the **End of Period Processing** program is run to update current balances and clear previous balances.

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