February 1979 $1.50

SoftSide™ "your BASIC software magazine"

Form **1040** U.S. Individual Income Tax Return **1978**

For Privacy Act Notice, see page 3 of Instructions | For the year January 1–December 31, 1978, or other tax year beginning , 1978, 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

Do you want $1 to go to the Presidential Election Campaign 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.

Spouse's occupation

Filing Status Check only one box.

1 2 3 4 5

Form 1040 TAMED

ity number

.... See page 6 of Instructions.
ee page 6 of Instructions.

Exemptions Always check the box labeled Yourself. Check other boxes if they apply.

6a ☐ Yourself — Blind
b ☐ Spouse — Blind
c First names of y
Enter number of boxes checked on 6a and b ▶
Enter number of children listed ▶
Enter number of other dependents ▶
Add numbers entered in boxes above ▶

d Other dependents:

(1) Name	(2) Relationship	(3) Number of months lived in your home	(4) Did dependent have income of $750 or more?	(5) Did you provide more than one-half of dependent's support?

7 Total number of exemptions claimed 7

Income Please attach Copy B of your Forms W-2 here. If you do not have a W-2, see page 5 of Instructions.

8	Wages, salaries, tips, and other employee compensation		8
9	Interest income (If over $400, attach Schedule B)		9
10a	Dividends (If over $400, attach Schedule B)	10b Exclusion	10c
11	State and local income tax refunds (does not apply unless refund is for year you itemized deductions)		11
12	Alimony received		12
13	Business income or (loss) (attach Schedule C)		13
14	Capital gain or (loss) (attach Schedule D)		14
15	Taxable part of capital gain distributions not reported on Schedule D (see page 9 of Instructions)		15
16	Net gain or (loss) from Supplemental Schedule of Gains and Losses (attach Form 4797)		16
17	Fully taxable pensions and annuities not reported on Schedule E		17
18	Pensions, annuities, rents, royalties, partnerships, estates or trusts, etc. (attach Schedule E)		18
19	Farm income or (loss) (attach Schedule F)		19
20	Other income (state nature and source—see page 10 of Instructions) ▶		20
21	Total income. Add lines 8, 9, and 10c through 20 ▶		21

Please attach check or money order here.

Adjustments to Income

22	Moving expense (attach Form 3903)	22	
23	Employee business expenses (attach Form 2106)	23	
24	Payments to an IRA (see page 10 of Instructions)	24	
25	Payments to a Keogh (H.R. 10) retirement plan	25	
26	Interest penalty due to early withdrawal of savings	26	
27	Alimony paid (see page 10 of Instructions)	27	
28	Total adjustments. Add lines 22 through 27 ▶		28

Adjusted Gross Income

29	Subtract line 28 from line 21	29
30	Disability income exclusion (attach Form 2440)	30
31	Adjusted gross income. Subtract line 30 from line 29. If this line is less than $8,000, see page 2 of Instructions. If you want IRS to figure your tax, see page 4 of Instructions ▶	31

ADVENTURE!

A TOMORROW GAME — TODAY!

Unlike anything else we carry — more complicated than **Treasure Hunt**. There are hardly any rules. Finding out is the game, or is this actually a game? It has no practical use ... so, it must be a game, right? Confused? You'll feel like you're in control of HAL, that famous schizophrenic computer from **2001**, only not quite as sharp. Discover Adventure on land or with the pirate!

P.S. The Staff plays **Adventure**.

Available for 32K Disk Systems ONLY

Includes both land and pirate adventures

Price, $24.95

TRS-80 Software Exchange

17 Briar Cliff Drive Milford, New Hampshire 03055

SoftSide™

February 1979

"your BASIC software magazine"

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For uniformity, we have adopted the Radio Shack TRS-80 Level II BASIC as the BASIC dialect used within the pages of this magazine. It was chosen because it stands to become the most commonly used dialect among microcomputer users and because it shares a common heritage with the many microcomputer languages produced by Microsoft.

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Just to Let You Know ...

It's difficult to write an editorial of any real substance about personal-use software and not expose ourselves to charges of giving way to self-serving interests. On the other hand, as a publication and distributor of software, we feel have valid insights into the present and near future of personal software. Wayne Greene, the publisher of another magazine, has commented extensively on the riches to be won writing software. His column is at worst, interesting — even brilliant at times — but his conclusions often run errant as his enthusiasm takes charge.

Software is very much an area of pure competition. Easy entry, pleasant working conditions and tremendous job satisfaction have brought out the best and the worst of a free-wheeling market. Best perhaps, is the astonishing progress in the quality and variety of personal-use software. Worst is probably the confusion that always accompanies rapid growth. As in the western mining towns of the late 1800's, many elements of Boomism are present: furious activity, ferocious competition, grand schemes, industrial heavyweights staking out claims (just in case), the naive risking all for the chance to strike it rich, camp followers supporting their favorites — and the beat goes on.

Let's cast a few roles in this tumultuous infant industry. For the sake of allegory, we'll continue with the early mining era. Computer manufacturers represent the mountain range in which we software folks work, the highest peak of all being Mt. Radio Shack (and it's richest vein, the TRS-80). Just as mountains provide no maps to lead to their riches, neither does Radio Shack. Rumors constantly surface alluding to a ''secret map'' (the TRS-80 mailing list) to untold riches within Mt. Radio Shack, but thus far it's only camp scuttlebut. We ourselves have fallen victim and suffered a minor loss to someone claiming possession of ''the secret map''. Live and learn...

We know of another who proclaims to be on special terms with the Lord of the Mountain ... perhaps so. Our experience and common sense have led us to conclude that Corporate Mountains seek their own interest just as they are charterd to do, and for one to yield a map of such uncharted wealth to another seems most out of character with the Grand Plan. (Who's kidding whom? Radio Shack sells more software than all the peripheral efforts

CHECKMATE

Sargon

by Dan & Kathe Spracklen

Winner of the 1978 West Coast Computer Faire, this revolutionary chess playing program won 5 games out of 5 played. Sargon is written in Z-80 language using the TDL Macro Assembler and occupies 8K RAM — 2K for data areas, 2K for graphics display and user interface, 4K move logic. Spectators were left in awe as the formidable field of opponents including Chess Challenger -10, Chess Challenger -3, Boris, Atari, and Microchess 1.0 was defeated.

Level II, 16K — $19.95

SARGON MANUAL

114 page comprehensive manual — $14.95

Chess Companion

by M. Kelleher

Plan your own chess tournament. Chess companion keeps track of all strategic maneuvers, even when the action is fast and furious, plus serves as a chess clock and offers a complete listing of moves for review at any time.

Level II, 16K — $7.95

Micro Chess 1.5

by Peter Jennings

The culmination of two years of program development, this chess playing program offers three levels of play. Each move examined for legality; current position displayed on a graphic chess board.

Level I or II,4K — $19.95

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combined; and probably many times over!) Periodically, the Lord of the Mountain is susceptible to good business sense, but such philanthropy would surely place a few High Priests in exile. (Point of fact: a few of the authors we deal with have done work for Radio Shack. The offer of twenty-five cents per package retailing over twenty dollars was made and accepted. The author has done quite well, and Radio Shack is no longer so generous).

Down here at the base of the mountain, we work frantically to gather whatever nuggets fall free. It's hard work, and all is reinvested. Experience shows that claims of unbelievable riches are just that — unbelievable. But, if we all keep at it steadily, they may pan out one day.

SoftSide is coming along beautifully. Favorable reader response and support from authors has been encouraging beyond description. It's not your normal magazine, it's a pioneer in trying to support itself at the software end of personal computing. To that end, we are our own best advertiser. It may seem like an abuse, however, to be quite frank, SoftSide would be a net loser on the balance sheet without the retail support of the TRS-80 Software Exchange. In short, we acknowledge the connection. It's just that connection which assures continuing quality software and fiscal soundness.

Conversely, due to SoftSide, the TRS-80 Software Exchange is doing well on all fronts. Obviously in sales, but more importantly, in providing credibility when contacting quality writers, publishers and manufacturers. "Thanks to you, it's working" sounds like someone else's tag line, but thanks to you, IT IS!

The news from the shipping room is good. Long-awaited shipments from mass duplicators have arrived, and delivery of orders has been cut to a matter of days (plus mail time). Those of you who have waited what must have seemed an eternity, take heart — your order is on the way.

Undoubtedly, you have encountered the problem of tapes not loading. Well, we don't have that licked entirely either. An estimated five percent of our cassettes are returned. That's not the model of quality control, however, it's not an unusual figure for the industry at this time. Before you get upset, appreciate the following factors: your machine, the tape and the duplication — any of these three can fault the program. Some of those factors can be improved at considerable expense, but such costs are presently prohibitive. Someday, someone will come up with the answer — until then, consider it the nature of the beast. Naturally, replacements are provided whenever the original is returned.

RWR

TRS-80 Software Exchange

ESP Tester

by Frank Rowlett Remember the ink blots and funny patterns? Well, here's your chance to see just how well you can read your computer's mind. TRS-80 picks the pattern, and you read it's mind. Very nice graphics. Level I or II,4K $4.95

Sink 'Um

by Rev. George Blank Sorry, Captain, the tubes are still being loaded...and so it goes. This arcade level action simulation lacks little. To be successful, you must plan carefully and have a keen sense of timing. Oh! Your torpedoes! Well, you'll find out. Level II, 4K $4.95

Mail List I

by Mike Kelleher This is the Volkswagen of the disk-based mailing list programs. Only requires 16K with a single drive and handles up to 1400 names per disk. Provisions made for some sorting options. 16K Disk $19.95

Z80 Instruction Handbook

by Scelbi Publications Your complete reference to the powerful Z80 instruction set. $4.95 (incl. shpg.)

Educator Assistant

by Steve Reisser Five programs to assist educators in computing percentage, individual student averages, class averages, standard test scores and final grade computation. Usable from Elementary to post-doctoral level. Level II,16K Cassette-$9.95
Disk $14.95

DISK SOFTWARE FOR TRS-80 LEVEL II

DISK PAYROLL

Written to be a useful tool for the individual who has joined the growing number of men and women using microcomputers in their business to save time and increase accuracy in record keeping. Even if you have never seen a computer before, you can run **DISK PAYROLL**. The programs included on the diskette are **interactive**, that is, they ask questions in English and expect you to type answers on the keyboard. All data files are handled on your diskette automatically — no cassette tapes are necessary.

A comprehensive 24-page manual with step-by-step instructions on how to run each program is included in the package. Quarterly summaries as well as payroll information can be printed on line printer. Programs supplied on a high quality 5¼ inch diskette. Price, $59.95

INVENTORY SYSTEM 2.2

This program allows for the creation, maintenance and review of over 2000 inventory items per clean diskette. The system is designed to operate under Radio Shack BASIC, DOS2.1, with a minimum memory allocation of 16K RAM. Data maintained for each inventory item includes: description (up to 15-character length in any combination of alphanumerics or punctuation), vendor name of code (any 8-character alphanumeric or punctuation combination), quantity of inventory item on hand, cost per unit, retail price per unit, reorder point, quantity sold, quantity purchased.

Inventory System 2.2 is based upon the utilization of "random files" with 6 sub-records per random file buffer. This method of data storage allows for maximum utilization of diskette space and is briefly discussed in the Radio Shack DOS 2.0 Users Manual. It is assumed the user is familiar with the TRS-80 operation methods as well as Radio Shack Disk BASIC and DOS 2.1. If you need information in depth, consider Inventory 2.0 as an alternative.

Price, $59.95

INVENTORY SYSTEM 2.0

Inventory System 2.0 is based on Radio Shack Disk BASIC and DOS 2.1, utilizing a random file data storage method. It offers comprehensive inventory control of up to 340 separate items per clean diskette. Any number of disk drives may be utilized. It is assumed the user is familiar with the basic operation of the TRS-80 disk BASIC and the DOS operating system 2.1. Provides for file names, item description, new data entry, adjusted inventory, ledger maintainence, delete/review, management reports: review of selected items without maintenance routines, complete cost analysis of all items, alert for minimum levels. Each program is designed to be as self-prompting as possible for ease in operation. Sample date file included to enable user to familiarize himself with the system through manipulation of the posting, maintenance and reporting functions until prepared to utilize them. Price, $39.95

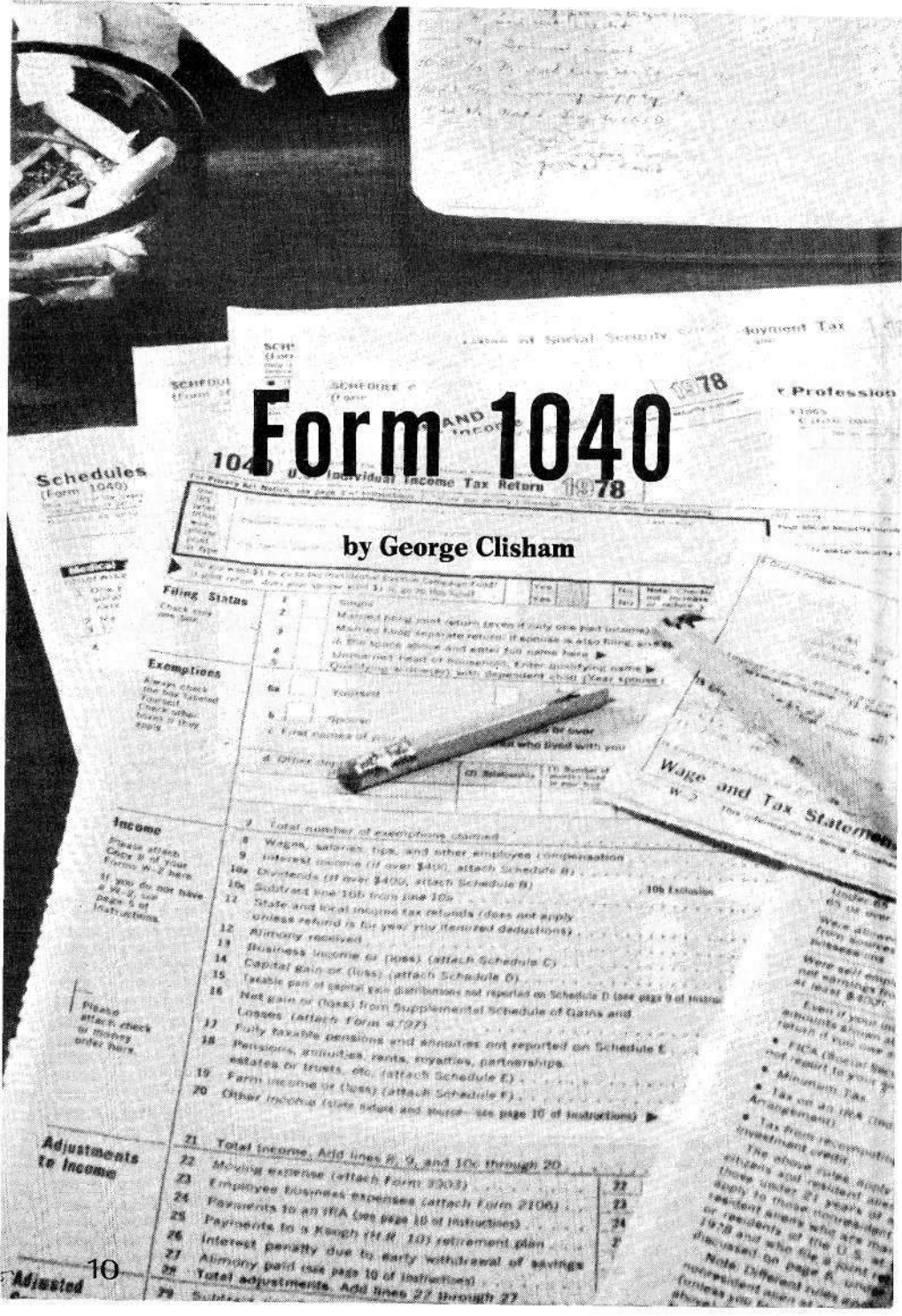
ACCOUNTS RECEIVABLE 2.0

Designed for use by any small to medium volume business operation requiring sophisticated control of accounts receivable. This particular system is based upon Radio Shack Disk BASIC and the companion disk operating system known as (DOS 2.1). Notes included in the package convey all necessary instructions to implement the accounts receivable system 2.0 successfully, however, it is impossible to discuss many facets of operation relative to the TRS-80 computer itself. It is, therefore, assumed that the user is familiar with both the TRS-80 Level II Reference Manual and the TRSDOS 2.0/2.1 instruction manuals which accompany TRS-80 equipment. Price, $59.95

DISK PROGRAMS ON THESE PAGES
MAY BE ORDERED DIRECTLY FROM

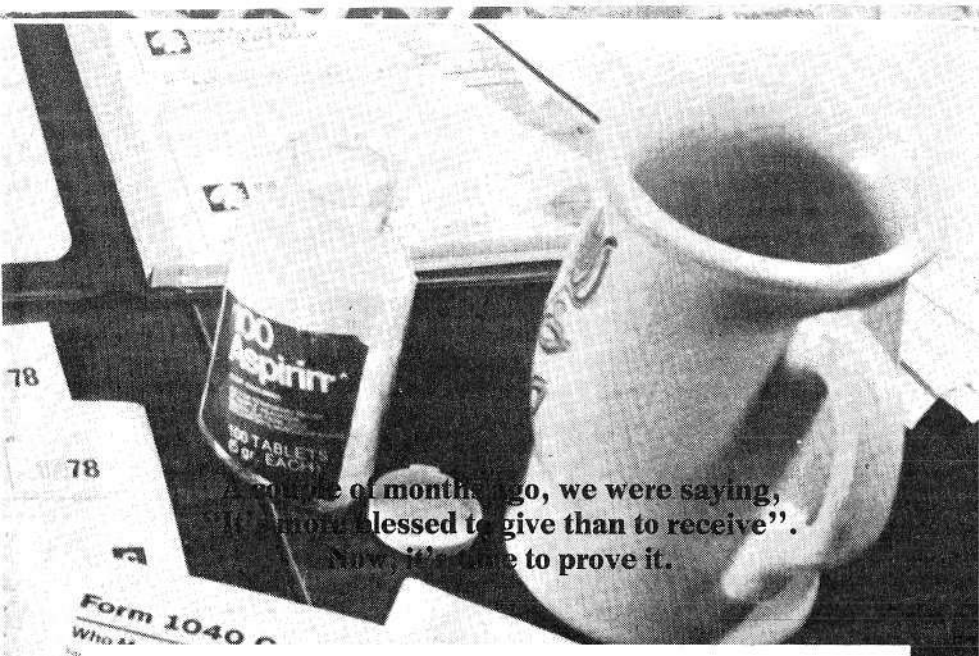
TRS-80 Software Exchange

17 Briar Cliff Drive Milford, New Hampshire 03055



Form 1040

by George Clisham



A couple of months ago, we were saying, "It's more blessed to give than to receive". Now, it's time to prove it.

It's tax time again, and all across America, dockworker, stockbroker and farmer alike are bracing for the annual drudge. From out of the cursing, gnashing of teeth and broken pencils, a common refrain emerges: "There MUST be an easier way!"

If you're among the over 100,000 TRS-80 owners, there IS an easier way, and if you started your year off with the cassette version of SoftSide, it's easier still!

SoftSide presents: 1040

Begin by loading the program — either from cassette or keyboard (about 1300 bytes). If the program is input by keyboard, you're almost certain to have some minor debugging ahead. If you've loaded from cassette, be sure to first list program to make sure it has loaded properly.

Once loading is accomplished, pull out your copy of Form 1040, make sure all of your facts and figures are in order, and you're on your way.

The program begins with the first page of Form 1040, then prompts for information one line at a time — as if you were reading the form yourself. All answers are entered as Y or N, except where a numeric figure is requested, in which case you will enter the appropriate amount from your tax records, or a zero if it doesn't apply to you. NOTE: Make sure you have input the proper information before pressing ENTER. It's a lot easier to double-check each input than to restart the program from scratch.

Since prompts appear for any required information, the program is

TRS-80 DISK USERS

Your data is worthless if you can't store it safely until you need it. Chances are, you've already discovered that the hard way...

Verbatim

Certified Diskettes

Engineered and designed for:

- **Ease of Operation**
- **Self-checking Calibration**
- **Flexibility**
- **Ease of Maintenance**

Diskettes compatible with TRS-80 system available in boxes of 10 for $34.95 (plus $1.00 shipping charge)

Master Charge & VISA accepted

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self-explanatory. A couple of areas, however, do warrant some additional instruction:

•If any of your inputs are way out of line, or if your particular situation deviates greatly from an established norm, the computer will inform you that such unreasonable data may cause your return to be audited.

•Your medical deductions can be entered just as they are. The program will check against your gross salary for the medical and medicine percentages, and apply them against your medical credits if any are due.

•After you have completed entering all information, you will be prompted to look up your tax on X, Y, Z, or other tables, and will be asked for Income Averaging figures. You may check to see if you would pay less tax by using this method. Again, this is done by simply supplying the requested data. The program will retain the original figure in either case.

Next, the computer will display all of the figures required to properly fill out your return, keyed to line numbers on your Form 1040. (See sample 1040 on page 16.) Just fill in the proper information, sign the forms, and if you owe money, attach the check or money order to the form with your other filing documents.

Due to the nature of this program, SoftSide assumes no liability for its use. Again, be sure to double check all entries before pressing ENTER, and if any of you are considering deducting your TRS-80 as an expense incurred in preparing your return, please give your new address to our subscription department: Warden, Cell Block, Prisoner Identification Number ... □

```
2 R=999
5 ' W.D. GLEATON -- 1978
10 DEFDBL A-Z
100 CLS:PRINT @15,"* * * 1040 TAX PROGRAM * * *"
110 PRINT"                    TRS80 QUALITY SOFTWARE"
180 PRINT"1040 FED. TAX PROGRAM INCLUDES SCHED 'A'EXEMPTIONS"
190 PRINT"SCHED 'G' INCOME AVERAGING SCHEDULES 'B'&'D' "
195 PRINT"SHOULD BE FILLED OUT BEFORE RUNNING PROGRAM ----  "
200 PRINT:INPUT "HIT ENTER TO CONTINUE";Q
220 PRINT "ANSWER ALL QUESTIONS WITH A 'Y' OR 'N' EXCEPT"
230 PRINT "WHERE A NUMERIC FIGURE GOES THEN ENTER ZERO"
240 PRINT:PRINT
270 PRINT "WE SHALL BEGIN WITH FIRST PAGE OF 1040"
280 PRINT:PRINT
310 M=0:J=0
330 PRINT:INPUT"ARE YOU SINGLE";Q$
332 IF Q$="Y" THEN M=2 :GOTO 440
340 INPUT"ARE YOU MARRIED FILING JOINT RET 'Y' OR 'N'";Q$
360 IF Q$="Y" THEN M=1:J=1:GOTO 440
370 INPUT "ARE YOU MARRIED FILING SEPERATE 'Y' OR 'N'";Q$
375 IF Q$="Y" THEN M=3:GOTO 440
380 PRINT:INPUT "ARE YOU UNMARRIED HEAD OF HOUSE";Q$
390 IF Q$="Y" THEN M=4:GOTO 440
400 PRINT:INPUT "ARE YOU QUAL-WIDOW(ER) W DEPENDANT";Q$
410 IF Q$="Y" THEN M=5:J=1:GOTO 440
420 PRINT "YOU HAVE ANSWERED QUESTIONS WRONG START OVER"
425 GOTO 330
440 INPUT "DO YOU CLAIM OTHER DEPENDENTS";Q$
450 IF Q$="Y":INPUT"ENTER NO. OF DEPENDENTS";D1
470 IF J=1THEN D=(2+D1):GOTO 510
480 D= (1+D1)
510 PRINT"IF EITHER YOU ARE YOUR SPOUSE OVER 65 ENTER 1"
520 PRINT" OR 2 (FOR JOINT RETURN IF BOTH) OR 0 FOR NONE"
530 INPUT E1:PRINT
550 PRINT"ARE YOU OR SPOUSE (IF FILING JOINT RET) BLIND?"
560 PRINT"ENTER 0=NO   1=YES-FOR-ONE  2=YES-FOR-BOTH":PRINT
600 INPUT B1:D=(D+E1+B1)
640 PRINT"ENTER ONLY YOUR GROSS WAGES ON YOUR W-2 FORM"
650 PRINT"SPOUSE ENTERED LATER":INPUT G1:PRINT
670 INPUT"ENTER YOUR FEDERAL WITHOLDING";F1:PRINT
```

```
700 IF J=0 THEN 750
710 INPUT"ENTER YOUR SPOUSE'S GROSS WAGES";G2:PRINT
740 INPUT"ENTER YOUR SPOUSE'S FED. WITHOLDING TAXES";F2:PRINT
750 GI=(G1+G2):FW=(F1+F2)
770 INPUT"ENTER ALL INTERESTS RECEIVED 'FROM SCHED--'B'";I1
790 PRINT
800 INPUT"ENTER DIVIDENDS RECEIVED FROM SCHED 'B' ";D3:PRINT
820 INPUT"ENTER AMT. DIVIDEND EXCLUSION LINE '108'";E0
825 D5=(D3-E0):G1=(G1+G2):F1=(F1+F2)
850 INPUT"DID YOU ITEMIZE DEDUCTIONS ON YOUR RETURN LAST YEAR ";Q$
860 PRINT:IF Q$="N":GOTO 930
890 PRINT"HOW MUCH STATE & LOCAL TAX REFUNDS DID YOU RECIEVE"
900 PRINT"FROM LAST YEARS TAX RETURNS?":INPUT S4:PRINT
930 INPUT"ALIMONY RECIEVED LN 12";A5:PRINT
960 PRINT"ENTER AMOUNT OF BUSINESS LOSS OR INCOME"
970 PRINT"IF LOSS ENTER NEGATIVE AMOUNT ATTACH SCHED 'C'"
980 PRINT"TO YOUR TAX FORMS":INPUT S5:PRINT
1000 PRINT"ENTER CAPITAL GAIN OR LOSS ATTACH SCHED 'D'"
1005 PRINT"IF LOSS ENTER NEGATIVE FIGURE"
1010 INPUT S6:PRINT
1015 INPUT"GAIN DIST NOT REPORTED ON SCHED 'D'";L5
1020 INPUT"ENTER GAIN OR (LOSS) FROM FORM '4797'";L6
1025 INPUT"ENTER TAXABLE PENSIONS NOT ON SCHED 'E'";L7
1030 INPUT"ENTER PENSIONS,RENTS,ROYALTIES, ON SCHED 'E'";L8
1040 INPUT"ENTER FARM INCOME OR LOSS LOSS=NEGATIVE";S7
1050 INPUT"ENTER ALL OTHER INCOME PG. 10 INSTRUCTIONS";OI
1070 TI=(GI+I1+D5+S4+A5+S5+S6+L5+L6+L7+L8+S7+OI):S8=TI
1090 INPUT"ENTER MOVING EXPENSES OR ZERO INCLUDE FORM 3903";M1
1130 INPUT"ENTER EMPLOYEE BUSINESS EXP ATTACH FORM 2106";B1
1140 INPUT"PAYMENTS TO 'IRA' PAGE 10 OF INSTRUCTIONS LN-24";R1
1150 INPUT"ENTER  PAYMENTS TO KEOGH (HR 10) RET ACCOUNT";R2
1160 INPUT"INTEREST LOST DUE TO EARLY WITHDRWL OF SAVINGS";R4
1170 INPUT"ENTER ALIMONY PAID PAGE 10 OF INSTR.";A7
1190 L1=(M1+B1+R1+R4+A7+R2):TC=(TI-L1)
1220 INPUT"DISABILITY INCOME EXCLUSION FORM 2440";D8
1240 AG=(TC-D8):IFAG<8000 THEN 1245
1242 GOTO 1270
1245 PRINT "YOU MAY QUALIFY FOR EARNED INCOME CREDIT"
1250 PRINT "GO TO PAGE 2 OF INSTRUCTIONS AND FILL OUT"
1255 INPUT "WORKSHEET ENTER AMT ON LINE 13 HERE";EI
```

```
1270 PRINT "THIS COMPLETES FIRST PAGE OF FORM 1040. WE WILL"
1280 PRINT "NOW DO SIDE TWO OF 1040"
1290 PRINT:PRINT:PRINT
1340 PRINT "DO YOU HAVE ANY CREDITS TO ENTER FOR LINES 38-48"
1345 PRINT"OF 1040 SIDE 2 IF NO ENTER 'N'"
1347 PRINT"*** NEW RESIDENTIAL ENERGY FORM 5695 ***"
1350 INPUT "*** IS ON LINE ----45 IN THIS AREA  ***";Q$
1430 IF Q$="N" THEN 1650
1560 INPUT"ENTER CREDIT FOR CONTRIBUTIONS LN-38";C1
1570 INPUT"ENTER CREDIT FOR ELDERLY   LINE 39 OR 0";C2
1580 INPUT"ENTER CHILD CARE EXPENSE  FORM 2441    ";C3
1590 INPUT"ENTER INVESTMENT CREDIT   FORM 3468 ";C4
1600 INPUT"ENTER FOREIGN TAX CREDIT  FORM 1116 ";C5
1610 INPUT"ENTER WORK INCENTIVE CREDIT FORM 4874";C6
1620 INPUT"ENTER NEW JOBS CREDIT     FORM 5884 ";C7
1630 INPUT"ENTER RESIDENTIAL ENERGY CREDIT FORM 5695";C8
1640 C9=(C1+C2+C3+C4+C5+C6+C7+C8)
1650 PRINT"IF YOU NEED TO FILL OUT LINES 48-53 OF 1040"
1660 INPUT"OTHER TAXES ENTER 'Y' OR 'N'";Q$
1670 IF Q$="N" GOTO 1730
1680 INPUT"ENTER SELF EMPLOYMENT TAX SCHED 'SE'";O1
1690 INPUT"ENTER MINIMUM TAX ATTACH FORM 4625 LN-49";O2
1700 INPUT"ENTER TAX FROM FORM 4255 LINE 50";O3
1710 INPUT"ENTER SOC SEC TAX FROM FORM 4137";O4
1720 INPUT"ENTER UNCOLL EMP FICA AND RRTA TAX ON TIPS";O5
1725 INPUT"ENTER TAX ON IRA FROM FORM 5329";O6
1728 O7=(O1+O2+O3+O4+O5+O6)
1729 INPUT"ENTER EST TAX PAYMENTS FROM 1977 RET LN 56";XX
1730 PRINT:INPUT"AMT. PAID WITH FORM 4868 LN-58";AP:PRINT
1732 INPUT"EXCESS FICA 2 OR MORE EMPLOYERS LN:59";EF:PRINT
1733 INPUT"ENTER CREDIT FOR SPECIAL FUELS FORM 4136";SF:PRINT
1735 INPUT"ENTER REG. INVESTMENT CREDIT FORM 2439";RI:PRINT
1738 TT=(FW+XX+EI+AP+EF+SF+RI):PRINT:PRINT
1739 PRINT"WE HAVE FINISHED SIDES 1 AND 2 OF 1040"
1740 PRINT:PRINT"SCHECULE 'A' ITEMIZED DEDUCTIONS "
1750 PRINT"WILL BE DONE NEXT":PRINT:PRINT:PRINT:PRINT
1800 REM THIS IS ITEMIZED DEDUCTIONS SCHEDULE A
1820 PRINT"IF YOU DON'T ITEMIZE TYPE IN 'NO'"
1830 PRINT"IF YOU DO TYPE IN 'YES'":INPUT Q$
1840 IF Q$="NO" GOTO 3150
```

78

8, or other tax year beginning , 1978, ending , 19

Last name

Your social security number

Spouse's social security no.

Your occupation

Spouse's occupation

No / No — Note: *Checking Yes will not increase your tax or reduce your refund.*

d income)

o filing, give spouse's social security number

▶

ng name ▶ . See page 6 of Instructions.

'ear spouse died ▶ 19). See page 6 of Instructions.

r ☐ Blind

r ☐ Blind

} Enter number of boxes checked on 6a and b ▶

th you ▶

} Enter number of children listed ▶

er of ived ome	(4) Did dependent have income of $750 or more?	(5) Did you provide more than one-half of dependent's support?

Enter number of other dependents ▶

Add numbers entered in boxes above ▶ 4

*20,143.15+18,000.00

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Form 1040 (1978)

Page 2

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e's signature (if filing jointly, BOTH must sign even if only one had income)

Preparer's social security no. Check if self-employed ▶ ☐

E.I. No. ▶

Date ▶

```
1860 PRINT"MEDICAL EXPENSE WILL BE DONE FIRST.":PRINT:PRINT
1900 PRINT"ENTER YOUR TOTAL MEDICAL INSURANCE PREMIUMS. "
1905 PRINT"THE PROGRAM WILL CALCULATE THE CORRECT AMOUNT"
1910 PRINT"YOU ARE ENTITLED TO AND GIVE YOU CREDIT."
1920 INPUT P1:V8=P1:P1=(P1*.5):PRINT
1930 V9=(P1-150):IF V9>0 PRINT "YOU ONLY GET 150.00 CREDIT"
1940 PRINT"YOU CAN ADD TO YOUR MEDICAL PAYMENTS"
1945 PRINT"AMOUNT OF INSURANCE OVER 150.00"
1947 PRINT"THIS AMOUNT":PRINT (V8-150.00)
1950 IF P1>150 THEN P1=150
1960 PRINT"HOW MUCH DID YOU PAY FOR PRESCRIPTIONS"
1970 INPUT P2:PRINT:P3=(AG*.01):P4=(P2-P3)
2010 IF P4=<0 THEN P4=0
2015 BP=(V8-150.00):IF P1 <150 THEN BP=(V8-P1)
2020 PRINT"ENTER ALL OTHER MEDICAL EXPENSES AND MISC. CHARGES"
2030 INPUT P5:PRINT:P6=(P4+BP+P5):P7=(AG*.03):P0=(P6-P7)
2070 IF P7>P6 THEN P0=0
2090 P9=(P1+P0):IF P9>685 GOSUB 5770
2130 PRINT"TAX EXPENSES WILL BE DONE NEXT.":PRINT:PRINT
2140 INPUT"ENTER STATE AND LOCAL INCOME TAX";Q1
2150 INPUT"ENTER ALL REAL ESTATE TAX";Q2
2160 INPUT"ENTER STATE AND LOCAL GASOLINE TAX SEE TABLES";Q3
2170 INPUT"ENTER GENERAL SALES TAX FROM TABLES";Q4
2180 INPUT"ENTER PERSONAL PROPERTY TAX";Q5
2190 INPUT"ALL OTHER ITEMIZED TAXES";Q6
2200 Q7=(Q1+Q2+Q3+Q4+Q5+Q6)
2420 IF Q7>.1*AG THEN GOSUB 5690
2430 PRINT:PRINT
2450 PRINT"INTEREST EXPENSES WILL BE DONE NEXT.
2460 PRINT:PRINT
2480 INPUT"ENTER AMOUNT INTEREST ON MORTGAGE";Q8
2490 INPUT"ENTER INTEREST ON CREDIT AND CHARGE CARDS";Q9
2510 PRINT"ENTER ALL OTHER INTEREST YOU PAID EX:CREDIT CARDS"
2515 PRINT"PERSONAL LOANS, CREDIT UNION, SECOND MORTGAGE, ETC"
2530 INPUT Q0:PRINT:TE=(Q8+Q9+Q0):PRINT
2560 IF TE>(.1*AG) GOSUB 5810:PRINT:PRINT
2590 PRINT"CONTRIBUTIONS WILL BE DONE NEXT."
2600 PRINT:PRINT
2620 INPUT"ENTER CASH CONTRIBUTIONS";X1
2650 PRINT"ENTER CASH VALUE OF OTHER CONTRIBUTIONS YOU HAVE"
```

```
2660 PRINT"TO NON-PROFIT ORGANIZATIONS SUCH AS FURNITURE - "
2665 PRINT"MILEAGE TO AND FROM ORGANIZATIONS FOR VOLUNTEER "
2670 PRINT"WORK PERFORMED  ETC....."
2675 INPUT X2:PRINT
2710 INPUT"ENTER CONT OTHER THAN CASH ";X3
2715 INPUT"ENTER CARRYOVER FROM PRIOR YEARS";X4
2720 X5=(X1+X2+X3+X4+X5):REM LINE 24:PRINT:PRINT
2730 PRINT"LOSSES WILL BE DONE NEXT."
2740 PRINT:PRINT
2760 INPUT"ENTER CASUALTY LOSSES BEFORE REIMBURSEMT";R6
2770 INPUT"AMOUNT REIMBURSED FROM INSURANCE";R7
2790 H1=(R6-R7):IF H1<0 THEN H1=0
2795 R8=100.00
2800 IF H1<100 THEN R8=H1:GOTO 2890
2880 IF R8<0 THEN R8=0
2890 R9=(H1-R8):IF H1=0 THEN R9=0
2900 PRINT:PRINT
2920 PRINT"MISCELLANEOUS DEDUCTIONS WILL BE DONE NEXT."
2930 PRINT:PRINT
2950 INPUT"ENTER ALL UNION DUES";R0
2980 PRINT"ENTER ALL OTHER MISC. DEDUCTIONS EX: COST OF JOB"
2985 PRINT"HUNTING, UNIFORMS, TOOLS ETC REQUIRED FOR JOB "
3000 INPUT U1:U2=(R0+U1)
3030 REM OLD TA(FLD) LINE 39
3040 IF(M=1)OR(M=5) THEN U4=3200.00
3050 IF(M=2)OR(M=4) THEN U4=2200.00
3060 IF M=3 THEN U4=1600.00
3070 TD=(P9+Q7+TE+X5+R9+U2):MI=(TD-U4)
3080 IFTD=0THEN MI=0
3100 IF U4>TD THEN MI=0:PRINT
3150 IF M=10RM=5GOTO3200
3160 GOTO 3210
3200 IF AG >40000 THEN TM$="X, Y, C OR TC PART1":GOTO 3220
3202 TM$="A, B, C, D":GOTO 3220
3210 IF AG >20000 THEN TM$="X, Y, C OR TC PART1":GOTO 3220
3215 TM$="A, B, C, D"
3220 PRINT "YOUR TOTAL ADJUSTED INCOME IS";AG
3230 PRINT"THE TOTAL NUMBER OF EXEMPTIONS YOU CLAIMED IS";D
3235 Y1=(AG-MI)
3237 X7=(AG-MI)
```

```
3240 PRINT"YOUR TAXABLE INCOME IS$";V1;" "
3245 PRINT"LOOK UP THIS AMT.  IN TAX "
3250 PRINT"TABLES ";TM$;" ENTER YOUR TAX HERE":INPUT RT
3260 INPUT "DO YOU WISH TO CHECK INCOME AVERAGING";Q$
3262 IF Q$="Y" GOSUB 9500
3265 INPUT"ENTER ADDITIONAL TAXES FROM FORM 4970 LN-36";AT
3280 REM INCOME AVERING WORKED IN HERE
3290 TJ=(RT+AT):BT=(TJ-C9):O7=(O7+BT)
3295 X7=(AG-MI)
3300 IF TT>O7 THEN K1=(TT-O7)
3302 IF O7>TT THEN K2=(O7-TT)
3305 IF TT>O7PRINT"** YOU HAVE A REFUND OF";K1;" DOLLARS **"
3308 PRINT:PRINT
3440 PRINT"THIS FINISHES THE QUESTIONING SECTION OF THE 1040 TAX PROGRAM."
3450 PRINT "NOW PROGRAM WILL PRINT YOUR TOTALS TO BE USED IN"
3460 PRINT "IN FILLING OUT YOUR TAX FORMS '1040' SIDE ONE"
3470 PRINT "WILL BE DONE FIRST"
3500 PRINT
3580 REM THIS FILLLS IN THE BLANKS FOR THE 1040 AND SCHEDULE 'A'
3600 PRINT"LINE NUMBERS AND AMOUNTS WILL BE PRINTED"
3610 PRINT"ON THE SCREEN FOR YOU TO FILL IN ON YOUR 1040 FORM"
3620 PRINT"HIT ENTER WHEN YOU ARE READY TO FILL OUT YOUR FORM"
3630 INPUTQ$:GOSUB 3640:GOTO 3710
3640 CLS
3650 CLS:PRINT"LINE NUMBER","      ","AMOUNT"
3655 PRINT    "----------","******","------"
3660 PRINT:PRINT
3680 RETURN
3710 PRINT TAB(6);"7",,D
3730 PRINTTAB(6);"8",,GI
3750 PRINTTAB(6);"9",,I1
3760 PRINTTAB(4);"10A",,D3
3765 PRINTTAB(4);"10B",,E0
3770 PRINTTAB(4);"10C",,D5
3790 PRINT TAB(5);"11",,S4
3810 PRINTTAB(5);"12",,A5
3811 PRINTTAB(5);"13",,S5:PRINTTAB(5);"14",,S6
3812 INPUT"HIT ENTER FOR NEXT PAGE";Z$
3814 GOSUB 3640
3820 PRINTTAB(5);"15",,L5:PRINTTAB(5);"16",,L6
```

```
3820 PRINTTAB(5);"17",,L7:PRINTTAB(5);"18",,M5
3830 PRINTTAB(5);"19",,S7
3880 PRINTTAB(5);"20",,OI
3890 PRINTTAB(5);"21",,TI
3910 PRINTTAB(5);"22",,M1
3920 PRINTTAB(5);"23",,B1
3925 INPUT"HIT ENTER FOR NEXT PAGE";Z$
3928 GOSUB 3640
3930 PRINT TAB(5);"24",,R1
3940 PRINTTAB(5);"25",,R2:PRINTTAB(5);"26",,R4
3950 PRINT TAB(5);"27",,A7
3970 PRINTTAB(5);"28",,L1
3990 PRINTTAB(5);"29",,TC
4010 PRINTTAB(5);"30",,D8
4030 PRINTTAB(5);"31",,AG
4070 PRINT"THIS IS THE END OF PAGE 1 1040 NOW THE"
4080 PRINT"BACK SIDE WILL BE FILLED IN."
4090 INPUT"HIT ENTER FOR NEXT PAGE";Z$
4100 GOSUB 3640
4140 PRINTTAB(5);"32",,AG
4160 PRINTTAB(5);"33",,MI
4180 PRINTTAB(5);"34",,X7
4200 PRINTTAB(5);"35",,RT
4210 PRINTTAB(5);"36",,AT
4220 PRINTTAB(5);"37",,TJ
4230 PRINTTAB(5);"38",,C1
4240 PRINT TAB(5);"39",,C2
4260 PRINTTAB(5);"40",,C3
4265 INPUT"HIT ENTER FOR NEXT PAGE";Z$
4267 GOSUB 3640
4280 PRINTTAB(5);"41",,C4
4285 PRINTTAB(5);"42",,C5:PRINTTAB(5);"43",,C6
4290 PRINTTAB(5);"44",,C7:PRINTTAB(5);"45",,C8
4300 PRINT TAB(5);"46",,C9
4320 PRINTTAB(5);"47",,BT
4325 PRINTTAB(5);"48",,01:PRINTTAB(5);"49",,02
4328 INPUT"HIT ENTER FOR NEXT PAGE";Z$
4329 GOSUB 3640
4330 PRINTTAB(5);"50",,03:PRINTTAB(5);"51",,04
4335 PRINTTAB(5);"52",,05:PRINTTAB(5);"53",,06
```

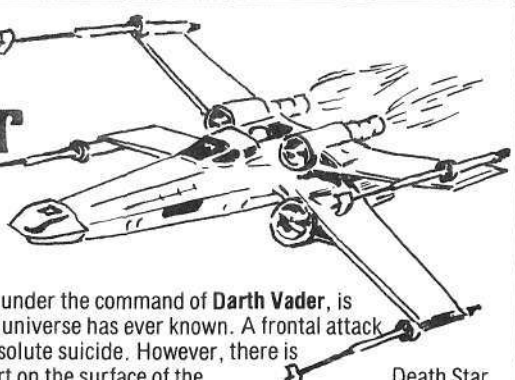
```
4340 PRINTTAB(5);"54",,07
4360 PRINTTAB(5);"55",,FW
4380 PRINTTAB(5);"56",,XX
4400 PRINTTAB(5);"57",,EI
4405 PRINTTAB(5);"58",,AP:PRINTTAB(5)"59",,EF
4406 INPUT"HIT ENTER FOR NEXT PAGE";Z$
4408 GOSUB 3640
4410 PRINTTAB(5);"60",,SF:PRINTTAB(5)"61",,RI
4420 PRINTTAB(5);"62",,TT
4440 PRINTTAB(5);"63",,K1
4460 PRINTTAB(5);"64",,K1
4465 PRINTTAB(5);"65";"  ENTER AMT. OF TAX TO CRDT TO 1979 TAX"
4480 PRINTTAB(5);"66",,K2
4485 INPUT"HIT ENTER FOR NEXT PAGE";Z$
4510 CLS
4560 PRINT"THIS END THE PRINT OUT OF THE '1040' TAX TOTALS.  THE"
4570 PRINT"FOLLOWING LINE NUMBERS WILL REFLECT THE FIGURES"
4580 PRINT"WHICH ARE USED ON SCHEDULE 'R'."
4590 PRINT:INPUT"HIT ENTER FOR NEXT PAGE";Z$
4600 GOSUB 3640
4690 PRINTTAB(6);"1",,P1
4710 PRINTTAB(6);"2",,P2
4740 PRINTTAB(6);"3",,P3
4750 PRINTTAB(6);"4",,P4
4760 PRINTTAB(6);"5",,BP
4770 PRINTTAB(6);"6",,P5
4790 PRINTTAB(6);"7",,P6
4810 PRINTTAB(6);"8",,P7
4830 PRINTTAB(6);"9",,P0
4850 PRINTTAB(5);"10",,P9
4860 INPUT "HIT ENTER FOR NEXT PAGE";Z$
4865 GOSUB 3640
4870 PRINTTAB(5);"11",,01
4890 PRINTTAB(5);"12",,02
4910 PRINTTAB(5);"13",,03
4930 PRINTTAB(5);"14",,04
4950 PRINTTAB(5);"15",,05
4970 PRINTTAB(5);"16",,06
4990 PRINTTAB(5);"17",,07
5010 PRINTTAB(5);"18",,08
```

```
5030 PRINTTAB(4);"100",,09
5040 PRINTTAB(5);"19",,08
5050 PRINTTAB(5);"20",,TE
5055 INPUT"HIT ENTER FOR NEXT PAGE";Z$
5060 GOSUB 3640
5070 PRINTTAB(5);"21",,X1
5080 PRINTTAB(4);"210",,X2
5090 PRINTTAB(5);"22",,X3
5110 PRINTTAB(5);"23",,X4
5130 PRINTTAB(5);"24",,X5
5150 PRINTTAB(5);"25",,R6:PRINTTAB(5);"26",,R7
5170 PRINTTAB(5);"27",,H1
5190 PRINTTAB(5);"28",,R8
5210 PRINTTAB(5);"29",,R9
5230 PRINTTAB(5);"30",,R0
5235 INPUT"HIT ENTER FOR NEXT PAGE";Z$
5240 GOSUB 3640
5250 PRINTTAB(5);"31",,U1
5270 PRINTTAB(5);"32",,U2
5290 PRINTTAB(5);"33",,P9
5310 PRINTTAB(5);"34",,07
5330 PRINTTAB(5);"35",,TE
5350 PRINTTAB(5);"36",,X5
5370 PRINTTAB(5);"37",,R9
5390 PRINTTAB(5);"38",,U2
5410 PRINTTAB(5);"39",,TD
5430 PRINTTAB(5);"40",,U4
5435 INPUT"HIT ENTER FOR LINE 41";Z$
5440 GOSUB 3640
5450 PRINTTAB(5);"41",,MJ
5480 PRINT:INPUT"HIT ENTER FOR NEXT PAGE";Z$
5490 PRINT:PRINT
5500 PRINT
5510 PRINT"THIS FINISHES THE '1040' TAX PROGRAM. NOW YOU"
5520 PRINT"MUST FILL IN THE BLANKS ON CORRECT FORMS & SIGN"
5530 PRINT"THE FORMS CORRECTLY. IF YOU OWE MONEY BE SURE"
5540 PRINT"TO SEND A CHECK WITH THE FORMS":PRINT
5570 PRINT"THANK YOU FOR USING QUALITY PROGRAMS FOR THE"
5580 PRINT"TRS-80 LEVEL-II":PRINT:PRINT
5610 GOTO 8000
```

```
5690 PRINT:PRINT
5710 PRINT"YOUR TAXES "
5720 PRINT"ARE LARGER THAN EXPECTED FOR YOUR INCOME"
5730 PRINT"THIS MAY CAUSE YOUR RETURN TO BE AUDITED."
5740 PRINT:PRINT
5760 RETURN
5770 PRINT:PRINT
5790 PRINT"YOUR MEDICAL EXPENSES ";
5800 GOTO 5720
5810 PRINT:PRINT
5830 PRINT"YOUR INTERESTS "
5840 GOTO 5720
5850 PRINT:PRINT
5870 PRINT"YOUR CONTRIBUTIONS "
5880 GOTO 5720
5890 PRINT:PRINT
5910 PRINT"YOUR LOSSES COULD CAUSE YOUR RETURN"
5915 PRINT"TO BE AUDITED"
5920 PRINT:PRINT
5940 RETURN
5950 END
8000 END
9500 REM INCOME AVG.
9503 INPUT"ENTER NO EXEMPTIONS ON TAXES IN 1977";D7
9505 INPUT"ENTER TAXABLE INCOME 1977";N7
9510 E7=(D7*750.00):Y7=(N7-E7)
9520 INPUT"ENTER TAXABLE INCOME 1976";Y6
9530 INPUT"ENTER TAXABLE INCOME 1975";Y5
9540 INPUT"ENTER TAXABLE INCOME 1974";Y4
9545 B6=(1600.00):B7=(2200.00):B8=(3200.00)
9550 IFM=1ORM=5GOTO 9580
9555 IFM=2ORM=4GOTO 9600
9560 Y6=(Y6-B6):Y5=(Y5-B6):Y4=(Y4-B6):GOTO 9700
9580 Y6=(Y6-B8):Y5=(Y5-B8):Y4=(Y4-B8):GOTO 9700
9600 Y6=(Y6-B7):Y5=(Y5-B7):Y4=(Y4-B7)
9650 T%=(X7-(D*750.00)):Y8=(Y7+Y6+Y5+Y4):T3=(Y8*.30)
9800 A%=(T%-T3)
9900 IF A%<3000.00 GOSUB 10500:GOTO 11000
9905 L8=(A%*.20):L9=(T3+L8):PRINT"WE DON'T FIGURE IN LINE 18"
9910 I9=L9:GOSUB 9950:Z8=I9
```

```
9915 Z7=Z8:I9=T3:GOSUB 9950:Z6=I9
9920 Z5=(Z7-Z6):Z4=(Z5*4):W9=(Z8+Z4)
9925 PRINT"THIS IS YOUR INCOME AVERAGE TAX FROM SCHED 'G'"
9930 PRINT"OLD TAX AMOUNT ";RT
9935 PRINT"SCHD 'G' TAX AMOUNT ";W9
9940 PRINT"IF YOU WANT TO FILL OUT SCHED 'G' AND"
9945 INPUT"USE THIS LOWER RATE TYPE IN 'YES'";Q$
9947 IF Q$="YES"RT=W9:GOTO 11000
9948 GOTO 11000
9950 PRINT"ENTER TAX FROM X,Y,Z ON THIS AMOUNT ";I9
9965 INPUT I9
9990 RETURN
10500 PRINT"YOUR AVERAGEABLE INCOME LINE 14 SCHED G LT 3000.00"
10510 PRINT"YOU CANNOT USE SCHEDULE 'G'"
11000 RETURN
```


X-Wing Fighter



by Rev. George Blank

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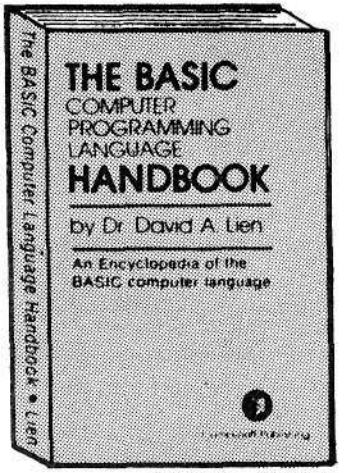

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Writing Good Computer Games

by Rev. George Blank
PO Box 456
Leechburg, PA 15656

Part II — Mechanics

In Part I of this article, I presented the philosophy and aesthetics of computer games. Let's now discuss the actual process of writing and marketing, from actual idea to the check in your mailbox.

The Idea

The starting point for almost any creative endeavor is an idea. Until you have an idea for a game, it is very difficult to write one. Some of the sources of ideas mentioned in the first part of the article were books, television, movies, sports, board games, historical situations and mythology. One you get an idea, play with it for a few days. Write it down. Can you think of any special twists that could make your game more interesting? I cannot overstress the importance of writing down your ideas, for two reasons: first of all, if you don't write them down, you will probably forget them; secondly, until you write it down, it will probably be hazy and unclear. Also, when you write an idea down, it forces you to state it clearly. I usually use a three ring notebook for each game that I'm working on and the first thing that goes into that book is a clear statement of the idea.

I have always been fascinated by sailing, and I thought it would be nice to write a simulation game based on the Clipper Ship races to China in the 19th century. That was the beginning of the idea. I went to the local library and got out a book on Clipper Ships. The book was lying beside the telephone one day when I got a call from a magazine editor who wanted to purchase a game I had submitted. During the conversation, I asked routinely if there were any games he would like to see written. He mentioned two: a real time, graphic, multi-dimensional lunar lander and a Clipper ship race around the Horn. I picked up the book and said, "You're not going to believe what I am holding in my hand." That is how my **'Round the Horn** game started.

During the period in which you are playing with the idea, do your research and write down several different versions of the idea. As I read about Clipper Ships, I dis-

covered that the trip around the Horn was not only for theChina trade, but was also important during the California Gold Rush. Right away the idea of San Francisco as a destination instead of Canton began to appeal to me, because it meant that I would only have to do a map of North And South America, and I could forget about Hawaii and China. In addition, I could make the game quicker, and pacing is important. I started collecting information on the most important Clipper Ships in the Gold Rush.

As I developed the idea, I began to think about the different factors that should have to be considered by the players, and I added these factors to my idea sheet. I have raced sailboats, and at one time served as an official in the Trans-Pacific Yacht Race, so I thought of such factors as winds, currents, course, different sets of sails, storm damage, supplies, navigation hazards, and personnel. After two or three weeks of research and idea refinement, I decided to get started.

Housekeeping

I have already mentioned my three ring notebook. When writing a program, I consider it of utmost importance to keep all information organized, so I prepared for the task of writing by setting up several categories.

I use an index to sub-programs, a copy of which is shown on page 32. I believe it is critical to write programs in several modules. That way I can add or delete a whole function from the program at any time, change the order in which functions are performed, and test each function to see that data is processed correctly in that module. So I typed out a list of the various functions which had to be performed within the overall program. Later, when I wrote each module, I wrote in the starting address of each, so that part of the page looked like this:

```
   00  Remarks
  100  Initialize
 8000  Display Ship
 8200  Display Waves
 9000  Navigation Chart
10000  Data
 8400  Test for Land
```

Once I thought of as many of the things my program would have to do as I could, I sat down and wrote a flow chart. I seldom do this, but in a complex program it helps to keep things organized. The flow chart also went into the notebook.

My next step was a table of variables. I used a mimeograph machine to run off a form, a copy of which is shown on page 32.

Each time I used a variable, I would add it to the chart, so that one line might look like this:

W Wave# **WR** Region

W[3,4] Weather **W$[3]** Waves

If I used a dimensioned variable, I recorded the uses on a separate page:

C Current Player

```
W[C,0]  Barometer Reading
[ ,1]   Change per hour
[ ,2]   Wind Speed
[ ,3]   Wind Direction
[ ,4]   Tack Power Factor
```

Once I had organized the notebook, I started writing the different modules of the program. Since the graphic display would dominate the game, I wrote my two graphic routines first. One displays North and South America, and the other is a view from the front of the ship with

an animated wave display. On graph paper, I sketched each one out and kept changing it until it looked like I wanted it to; then I simplified it as much as possible in the interest of speed. Often a module will require extra research; maps for the map routine, an atlas to determine wind patterns, navigation charts to determine ocean currents. Each module is written and tested, then linked to other parts of the program and tested again. As I write, I use a code for line numbers. All subprograms should start with a line number divisible by 100. Subsequent lines start at intervals of 10. If I have to add a line, it ends in 5. If I have to add several lines, I use 2, 4, 5, 6, and 8. The number 9 is reserved for remark statements, and the number 1 for test lines used to make sure the variables are operated on correctly. A typical program segment might look like this:

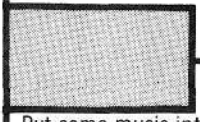
```
2299   REM * SHIPWRECK*
2300   CLS
2301   PRINT AT 50, H; V;
2305   PRINT "THE"; C$(C);
       "WAS LOST AT SEA"
```

Line 2301 would be a temporary test of the variables used in the subprogram to make sure that the routine functioned properly. After final debugging, all lines ending in 1 would be deleted.

Market testing

Once you have written the game in a rough form, get your friends to play it. I am especially fortunate as the pastor of a Presbyterian Church, for I have a church youth group that is delighted to play with my computer. I watch them play, listen to their comments and complaints (usually of the "Can't I play Star Wars?" variety), and ask questions. This is a critical factor, and I only

KEYBOARD 80



by John Adamson

Put some music into your life with this unique machine language program. Loads with SYSTEM command to create a three-octave diatonic scale organ.

Play your favorite tunes right on the TRS-80 keyboard. Simply load program, plug the "AUX" line into any audio amplifier, and start to play.

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Programmers on-line to offer assistance or advice. For complete information, see page 30, this issue.

ANNOUNCEMENT

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consider it the halfway point.

Rewriting

The best procedure at this point is to throw away everything you have done and start over. If you do, it will be a much better game. I am very hesitant to do this, but in the case of **'Round the Horn** I had help. I lost the whole program four different times due to system crashes, tape erasing, and a spoiled disk, having to start over each time then go back and test again.

Polishing

Polishing is a very critical step. The major considerations are pacing, suspense, graphics, animation and Murphy's Laws. I do each of these separately.

In considering the pacing, ask if the game flows smoothly. Is each player's turn too long or too short? Is there enough to do during the turn to avoid boredom? Is the action too fast to keep up with? Are the graphic sequences well paced? Are there dead spots in the game while the computer does some elaborate calculation or other time-waster, and if so, can they be broken up?

The suspense factor is very important to the TV generation. People who watch a lot of television are used to a dramatic moment every 7 minutes. That is Hollywood's way of getting us to refrain from switching channels during the commercials. But most games require enough suspense, or enough of a threat, to worry us in order to avoid boredom. In most games, the possibility of disaster adds interest.

In looking at the graphics displays, ask if there is any way to improve them. Do they look like what they represent? Here, it's best to get the opinion of someone who doesn't know what it is supposed to be. Are there ways to speed up the graphics, to use less memory, to simplify them, to add interest? In the game of **'Round the Horn**, the waves move, the land passes by, the sail shifts from side to side. Are there ways of making the animation more realistic?

Murphy's Law is the basic rule of programming: if something can go wrong, it invariably will. Find out how each of your variables behaves near the limits of its range. If they ever get near zero, find out what happens when they reach zero. Is there ever an attempt to divide by zero? If you have variables in your graphics routines, find out what happens when you get near the edge of the screen, or go off the screen, even if players would not normally do this in the game. Have a friend try the program out on his computer. I found out that while **'Round the Horn** would load and play in a 16K computer, at times it would fill up the memory with variables and create an out-of-memory error. Since I had a 32K computer, and simply measured the memory requirement by the amount of space left, I did not know about this until a friend tried the program. I had to rewrite the instructions in a shorter form.

The final step in the polishing is nearly impossible. Take your finished, polished program and play it for a month before you submit it to a publisher, and make sure all the bugs are gone. They are far less embarassing then.

Selling the Program

The next step is to decide how you would like to sell the program. If you are selling it to a magazine, you will have to write an interesting article to go along with it. Double

INDEX TO SUB PROGRAMS

Address	Label	Comment	Address	Label	Comment
00			00		
00			00		
00			00		
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00			00		
00			00		
00			00		
00			00		

PROGRAM **TABLE OF VARIABLES**

A_____A _____A(,)_____A$ _____

B_____B _____B(,)_____B$ _____

C_____C _____C(,)_____C$ _____

D_____D _____D(,)_____D$ _____

E_____E _____E(,)_____E$ _____

F_____F _____F(,)_____F$ _____

G_____G _____G(,)_____G$ _____

H_____H _____H(,)_____H$ _____

check your research, and throw some interesting facts into the article to provoke interest.

Software houses and some magazines publish the programs in machine-readable form. In that case, the instructions are the article, and they should be written with care.

In the case of **'Round the Horn**, I have a choice of marketing it to two magazines that publish TRS-80 programs on cassette tape, two magazines that publish games in BASIC specializing in the TRS-80, the Software Exchange, another major publisher of software, the general purpose computer magazines, and a whole bunch of small entrepeneurs. I could also market it myself, but I'm not going to make any decisions until that final month of polishing is over! □

Editor's note:
Congratulations to George on another fine submission. We hope this article has provided some added inspiration to all of you software artists who have been toying with that different idea, that unique approach, that new concept. And, when you've got it all together, we hope that you, too, will decide that SoftSide magazine and the TRS-80 Software Exchange are the place to be. Address all submissions to:

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Softside magazine
PO Box 68 Milford, NH 03055

Anyone out there feel up to tackling Mount Everest?

CALCULATOR

by Roger W. Robitaille, Sr.

A simple program which allows your TRS-80 to operate as a calculator, featuring one-key function codes and the ability to carry totals onward. The four basic arithmetic processes plus reciprocal, memory storage and retrieval, and reverse sign are allowed for already. Easily expandable to suit your particular purpose.

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SLALOM

by Denslo Hamlin

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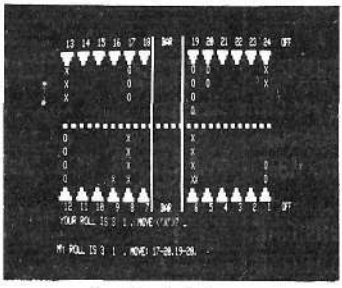
BACKGAMMON



by Scott Adams

The author of **Adventure** has made the TRS-80 into a pretty clever Backgammon player! However, you may avoid the embarassment by taking on your kids instead!

Excellent Graphics

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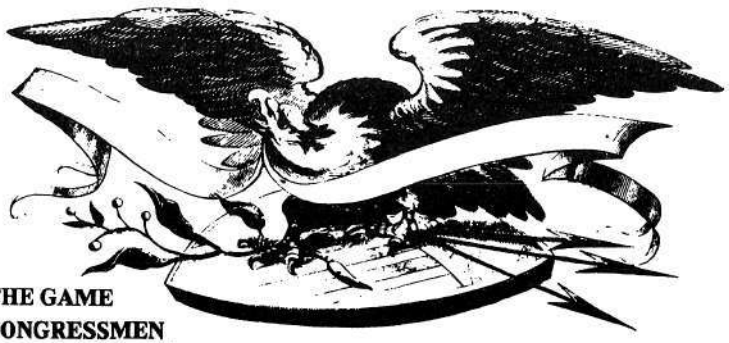
PORK BARREL



THE GAME
CONGRESSMEN
NEVER STOP PLAYING — REELECTION **By Rev. George Blank**

Okay so you've just been elected to Congress. You're young and looking forward to a long and rewarding career. And why shoudn't you be? Everyone loves you, or you wouldn't have been elected in the first place. It should be a snap, right?

The next thing you know, you're seated in the halls of Congress, tossing around billions of dollars like confetti at a ticker tape parade; Department of Defense, 340 billion last year, and looking for 380 billion this year; HEW got 30 billion last year, and say they need 10 billion more. By now, you're beginning to wonder—what about my effect on unemployment? Oh, no!! What about reelection?

Just when you're beginning to think that it might pay to keep a lower profile, (at least until you get the hang of it), the agenda moves into roll call voting. Sure you've got all the figures. You know what percentages of your constituency are blue collar workers, unemployed, elderly, farmers, etc., but the word is out that the President wants you to vote "yea" on this issue, and "nay" on that issue, and you wonder ... "Why is he doing this to me?" And the lobbies! Your district is telling you NO on increased Social Security benefits, but the liberal lobby keeps saying YE$, YE$, YE$, and after all ... **what about reelection?**

That's the scenario in this superb simulation from the author of Santa Paravia, 'Round the Horn, Troll's Gold. After you and up to 5 other players have finished your term in the hot seat, comes the moment you've been waiting for as you're up for reelection against such celebrities as Jane Fonda and Milton Schapp. How you fare depends entirely on your ability to be all things to all people at all times.

One thing's for sure, your constituency will let you know just how they feel ... are you listening, Richard?

Available for Level II, 16K TRS-80 Microcomputers —$9.95

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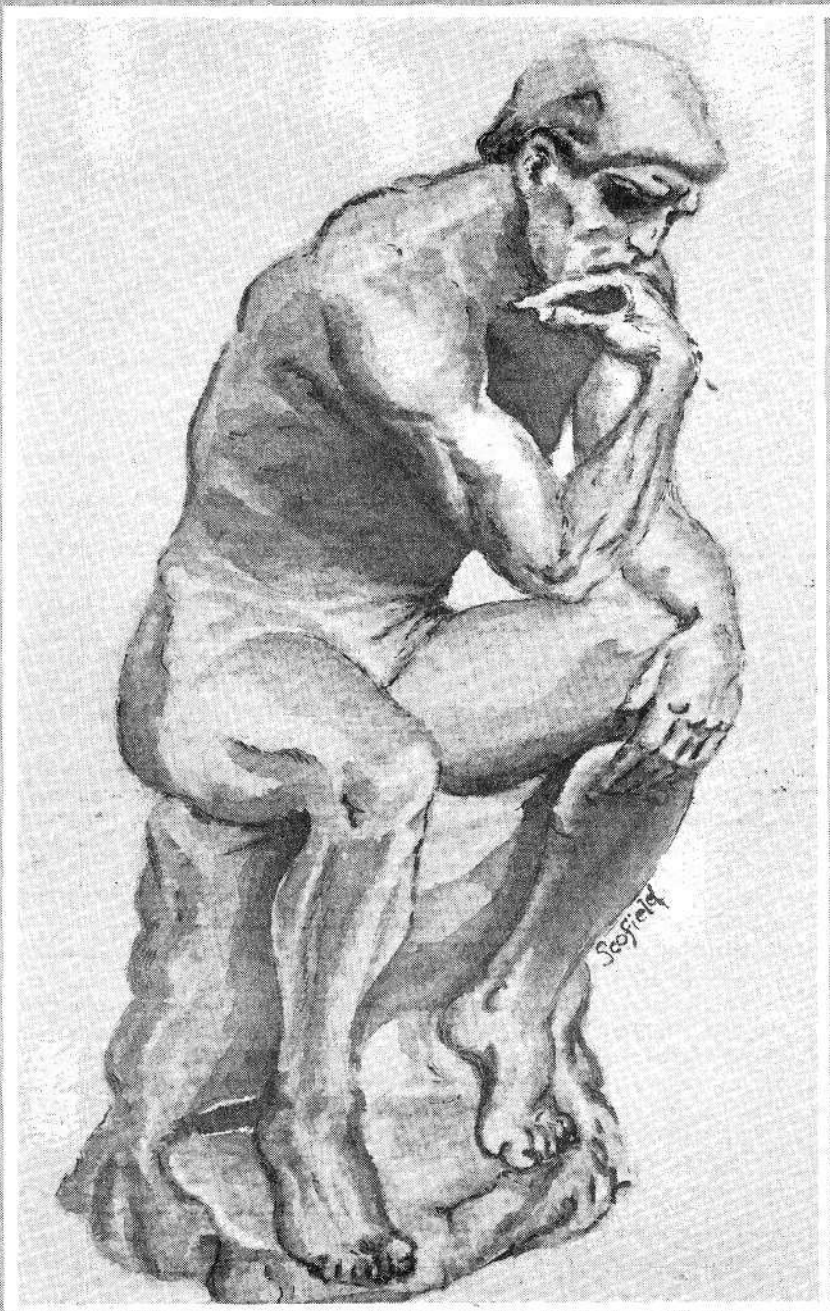
Seefried

CONCENTRATION

by Lance Micklus

Television game shows have been around for almost as long as television itself. Once rudely produced, "one gun" affairs, TV games hit an unprecedcented level of sophistication during the '60's, when game writers began to realize that the game itself wasn't nearly so interesting as watching the contestants sweat it out under the hot lights through one embarrassing situation after another.

One game capable of surviving on its own merits, with the home version game sales to prove it, is **Concentration**. In this version, the computer displays a playing board comprised of 32 numbered blocks, behind each of which is a prize of differing value. As those of you who remember seeing the game on TV will recall, for each item revealed on the board, another just like it lurks under a different square. The object is to concentrate on the board, and remember which items have been uncovered at each location, so that when your turn comes you can name them both and secure the prize.

When you have succeeded in matching two items on the board, you have won a battle, but not the war. You now have your first of a series of guesses at the computer's "secret number" (1 to 100). The computer will let you know if your guess was high or low. And, you'll do well to remember the number. When you make another match, you'll get another guess. Remember, every time you guess at the number or uncover an unknown square, you're helping your opponent. It may turn out that your last guess was just what he needed to make his match — unless he hasn't been concentrating.

The game ends on a note that I'm sure is familiar to all of us. When the "secret number" has been guessed, the computer announces the winner and offers a list of all prizes accumulated during the game. **Congratulations** — and then what?

What else ... a commercial!

```
1 REM ==========================================
2 REM  CONCENTRATION BY LANCE NICKLUS, WINDOSKI, VERMONT
3 REM  TRS-80 LEVEL 1 OR 2/16 K
4 REM  VERSION A01
5 REM ==========================================
100 CLS
105 PRINT : PRINT : PRINT
110 PRINT TAB(18),"C O N C E N T R A T I O N"
120 PRINT TAB(17),"--------------------------"
130 PRINT
140 PRINT"THIS IS THE GAME OF CONCENTRATION. PLAYED BY TWO PEOPLE. "
150 PRINT"I, THE COMPUTER, WILL MAKE UP THE GAME BOARD. YOU, THE HUMANS,"
160 PRINT"WILL TRY TO FIND THE MATCHING PRIZES. AFTER EACH CORRECT GUESS,"
170 PRINT"YOU WILL HAVE A CHANCE TO GUESS AT MY SECRET NUMBER. GUESS"
180 PRINT"RIGHT, AND YOU WIN ALL OF YOUR PRIZES. THE PLAYER WITH THE"
```

```
190 PRINT"GREATEST PRIZE VALUE AFTER THREE GAMES, WINS."
200 PRINT
210 DIMA(151)
220 FOR J = 32 TO 150 : A(J) = 0 : NEXT J
230 O = 0  :REM NUMBER OF GAMES PLAYED
240 C = 50  :REM NUMBER OF PRIZES IN DATA LIST
300 REM
310 REM     CREATE A GAME BOARD
320 REM   ----------------------
330 A(0) = 1 : A(1) = 1
340 FOR J = 1 TO 15
350 I = RND(C)
360 FOR K = 0 TO 31
370 IF A(K) = I THEN 350
380 NEXT K
390 A(J*2) = I : A((J*2)+1) = I
400 NEXT J
410 FOR J = 1 TO 400
420 I = RND(32) - 1
430 A(32) = A(I)
440 A(I) = A(31)
450 A(31) = A(32)
460 NEXT J
470 FOR J = 0 TO 31
480 IF A(J) <> 1 THEN A(J) = -A(J)
490 NEXT J
500 O = O + 1
510 A(46) = 0 : A(47) = 0 :REM PRIZE VALUE THIS GAME
520 P = 2
530 M = RND(100) :REM SECRET NUMBER
1000 REM
1010 REM     GAME LOOP
1020 REM   -------------
1030 IF P = 2 THEN P = 1 : GOTO 1100
1040 P = 2
1100 S = 99 : T = 99 : GOSUB 9030
1110 PRINT"PLAYER";P;:INPUT"- ENTER YOUR FIRST GUESS";S
1115 IF (S<1)+(S>32)+(S<>INT(S)) THEN GOSUB 1200 : GOTO 1100
1117 S = S - 1 : IF A(S) = 0 THEN GOSUB 1200 : GOTO 1100
1118 GOSUB 9030
```

```
                    GAME BOARD

 >>> 1 <<<    >>> 2 <<<    >>> 3 <<<    >>> 4 <<<
 >>> 5 <<<    >>> 6 <<<    >>> 7 <<<    >>> 8 <<<
 >>> 9 <<<    >>> 10 <<<   >>> 11 <<<   >>> 12 <<<
 >>> 13 <<<   >>> 14 <<<   >>> 15 <<<   >>> 16 <<<
DISNEYLAND TRIP >>> 18 <<<  >>> 19 <<<  >>> 20 <<<
 >>> 21 <<<   >>> 22 <<<   >>> 23 <<<   >>> 24 <<<
 >>> 25 <<<   >>> 26 <<<   >>> 27 <<<   >>> 28 <<<
 >>> 29 <<<   >>> 30 <<<   >>> 31 <<<   >>> 32 <<<

FOR THE DISNEYLAND TRIP, WORTH $ 750
PETER - ENTER YOUR SECOND GUESS? _
```

```
1120 IF A(S) > 0 THEN 1125
1121 A(S) = ABS(A(S)) : Z = A(S) : GOSUB 9530
1122 PRINT"FOR THE ";A$;", WORTH $";V
1125 PRINT"PLAYER";P;:INPUT"- ENTER YOUR SECOND GUESS";T
1130 IF (T<1)+(T>32)+(T<>INT(T)) THEN 1200
1135 T = T - 1
1140 IF S = T THEN GOSUB 1200 : GOTO 1118
1145 IF A(T) = 0 THEN GOSUB 1200 : GOTO 1118
1150 GOTO 1250
1190 REM * ILLEGAL MOVE *
1200 PRINT"SORRY, I CAN'T SHOW YOU THAT."
1210 FOR N = 0 TO 2000 : NEXT N
1220 RETURN
1240 REM * NO MATCH, SHOW SECOND ITEM & WAIT *
1250 GOSUB 9030
1260 IF (ABS(A(S))=ABS(A(T)))+(A(S)=1)+(A(T)=1) THEN 2000
1270 FOR N = 0 TO 3000 : NEXT N
1272 GOTO 1030
1275 REM
1277 REM     MAKE SURE THERE IS AT LEAST 1 MATCH POSSIBLE
1278 REM   ------------------------------------------------
1280 FOR N = 2 TO C
1290 X = 0
1300 FOR Y = 0 TO 31
1310 IF ABS(A(Y)) = N THEN X = X + 1
1320 IF A(Y) = 1 THEN X = X + 1
1330 NEXT Y
1340 IF X >= 2 THEN 1100
1350 NEXT N
1370 REM
1380 REM     TIE GAME, NO MORE MATCHES POSSIBLE
1390 REM   ------------------------------------
1400 S = -1
1410 GOSUB 9030
1420 PRINT"TIE GAME, NO WINNER."
1430 A(48) = A(44) : A(45) = A(49)
1440 GOTO 3210
1970 REM
1980 REM     GOT MATCH, MAKE GUESS AT SECRET NUMBER
1990 REM   ------------------------------------
```

```
2000 IF A(S) = 1 THEN A(S) = A(T)
2005 IF A(S) = 1 THEN 2110
2010 Z = ABS(A(S))
2020 GOSUB 9530
2030 A(47+P) = A(47+P) + 1
2040 A(49+A(47+P)+((P-1)*50)) = A(S)
2050 A(45+P) = A(45+P) + V
2060 A(S) = 0 : A(T) = 0
2100 PRINT"FOR THE ";A$;", WORTH $";V
2102 IF A(45+P) = V THEN 2110
2104 PRINT"AND A TOTAL OF";A(47+P)-A(43+P);"PRIZES WORTH $";A(45+P)
2110 INPUT"WHAT'S MY SECRET NUMBER (1-100)";J
2120 IF J = M THEN 3000
2130 IF J > M THEN PRINT"SORRY, YOUR GUESS IS TOO HIGH."
2140 IF J < M THEN PRINT"SORRY, YOUR GUESS IS TOO LOW."
2145 PRINT"BUT YOU STILL GET ANOTHER TURN.";
2150 FOR N = 0 TO 3000 : NEXT N
2160 GOTO 1200
2970 REM
2980 REM     WE HAVE A WINNER
2990 REM   ------------------
3000 S = -1
3010 GOSUB 9030
3020 PRINT
3030 PRINT"THAT'S CORRECT PLAYER";P
3040 PRINT"MY NUMBER WAS";M
3050 IF P = 1 THEN 3100
3060 A(48) = A(44)
3070 A(45) = A(49)
3080 GOTO 3210
3090 A(47+P) = A(47+P) - 1
3100 A(49) = A(45)
3110 A(44) = A(48)
3210 INPUT"HIT ''ENTER'' TO SEE YOUR PRIZES";B$
3300 FOR P = 1 TO 2
3310 CLS : K = 0 : A(41+P) = 0
3320 PRINT TAB(23),"PLAYER";P
3325 IFA(43+P)=0THENPRINT:PRINTTAB(14),"SORRY, YOU HAVE NO PRIZES.":GOTO3460
3330 PRINT" ","PRIZE","VALUE"
3340 FOR J = ((P-1)*50)+50 TO ((P-1)*50)+49+A(43+P)
```

```
3350 Z = ABS(A(J))
3360 GOSUB 9530
3370 PRINT" ";A$;"$";V
3380 K = K + 1
3385 A(41+P) = A(41+P) + V
3390 IF K <> 10 THEN 3450
3400 PRINT
3410 INPUT"HIT ''ENTER'' KEY TO CONTINUE";B$
3420 CLS
3430 PRINT TAB(23),"PLAYER";P
3440 PRINT" ","PRIZE","VALUE"
3450 NEXT J
3455 PRINT" "," ","-------":PRINT" ","TOTAL","$";A(41+P)
3460 PRINT
3470 INPUT"HIT ''ENTER'' KEY TO CONTINUE";B$
3500 NEXT P
3520 IF O = 3 THEN 3600
3530 CLS
3540 PRINT AT 128,"WE'LL BE BACK IN JUST A MOMENT WITH ROUND";O+1
3550 PRINT AT 466,"(INSERT COMMERCIAL HERE)"
3560 GOTO 330
3570 REM
3580 REM     END OF 3 GAMES, DECLARE A WINNER
3590 REM   ------------------------------------
3600 CLS
3610 IF A(42) > A(43) THEN P = 1 : GOTO 3630
3615 IFA(42)=A(43)THENPRINT@320,"TIE GAME, SO WE PLAY A RUBBER MATCH":GOTO330
3620 P = 2
3630 PRINT AT 320,"PLAYER";P;"WINS THE GAME!!!"
3640 PRINT"CONGRADULATIONS. HOPE YOU HAD FUN PLAYING"
3650 PRINT : PRINT
3660 PRINT TAB(18),"C O N C E N T R A T I O N";
8999 END
9000 REM
9010 REM     PRINT THE GAME BOARD
9020 REM   ------------------------
9030 CLS
9035 PRINT TAB(27),"GAME BOARD"
9040 FOR W = 0 TO 31
9050 IF A(W) = 0 THEN 9150
```

```
9055 IF S = -1 THEN 9100
9060 IF (W = S) + (W = T) THEN 9100
9070 PRINT@((W*16)+128),">>>";W+1;"<<<";
9080 GOTO 9150
9100 Z = ABS(A(W))
9110 GOSUB 9530
9120 PRINT@((W*16)+128),A$;
9150 NEXT W
9155 PRINT : PRINT
9160 RETURN
9500 REM
9510 REM     GET PRIZE AND VALUE
9520 REM  ----------
9530 RESTORE
9540 FOR Y = 1 TO Z
9550 READ A$, V
9560 NEXT Y
9570 RETURN
9970 REM
9980 REM     PRIZE LIST TO CHOSE FROM

9990 REM  ----------
9999 DATA * WILD CARD *, 0
10000 DATA NEW CAR, 5000
10005 DATA COLOR TV, 650
10010 DATA MOVIE OUTFIT, 400
10015 DATA BOX OF NAILS, 2
10020 DATA TRIP TO EUROPE, 1500
10025 DATA BALL POINT PEN, 2
10030 DATA PET DOG, 75
10035 DATA $1000 CASH, 1000
10040 DATA $1 CASH, 1
10045 DATA TRS-80 COMPUTER, 1000
10050 DATA STEREO SYSTEM, 850
10055 DATA DOZEN HOT DOGS, 2
10060 DATA DIAMOND WATCH, 875
10065 DATA CALCULATOR, 25
10070 DATA TENNIS SHOES, 20
10075 DATA DISNEYLAND TRIP, 750
10080 DATA LIVING ROOM SET, 1200
10085 DATA TABLE LAMP, 35
10090 DATA BEDROOM SET, 1150
10095 DATA STEAK DINNER, 12
10100 DATA ENCYCLOPEDIA, 400
10105 DATA TOY MOUSE, 4
10110 DATA FLASH LIGHT, 2
10115 DATA MOTOR HOME, 12000
10120 DATA MOTOR BOAT, 4000
10125 DATA DISHWASHER, 350
10130 DATA AIR CONDITIONER, 250
10135 DATA B&W TELEVISION, 75
10140 DATA SWIMMING POOL, 3500
10145 DATA SNOWMOBILE, 2000
10150 DATA BICYCLE, 165
10155 DATA WASHER-DRYER, 590
10160 DATA SILK SHEETS SET, 49
10165 DATA SOFA BED, 725
10170 DATA BOX OF CANDY, 2
10175 DATA POTS & PANS, 49
10180 DATA ELECTRIC CLOCK, 25
10185 DATA 1ST AID KIT, 8
10190 DATA TEA POT, 5
10195 DATA VACUUM CLEANER, 109
10200 DATA SEWING MACHINE, 350
10205 DATA MICOWAVE OVEN, 700
10210 DATA CARPET, 800
10215 DATA DRAPES, 150
10220 DATA ASH TRAY, 2
10225 DATA CANDLE, 4
10230 DATA THROW PILLOWS, 15
10235 DATA COFFEE TABLE, 85
10240 DATA TV TRAYS, 90
```

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Specs: Star Trek III

by Lance Micklus

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by M. Kelleher

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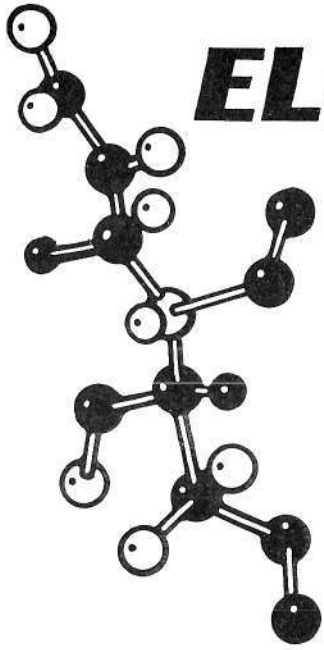


ELEMENTS QUIZ

by Roger W. Robitaille, Sr.

Grades of Au!

Remember High School science? If you're like most of us, you've probably put in your fair share of time poring over the periodic table at the back of your chemistry textbook, covering the symbols with a slip of paper. And, usually the night before an exam, you'd study feverishly hoping to retain the information at least until the next day...and that's about how long most of us remembered — until the next day, period.

SoftSide is hoping to turn the tables on one of the least pleasant aspects of traditional education — memorization — with this, the Elements Quiz. It's certainly nothing fancy from a programming point of view, but it demonstrates a way in which the computer can be of valid service as an educational aid, not only in learning the elements and their symbols, but for other tasks as well.

First off, the job of inputting the program should be performed by the person who will benefit most — the student. The very task of keyboarding can be a learning experience.

How many other uses can you find for this program? By simply substituting the elements and their symbols with other researched information, the program could just as easily call out names and dates for that history quiz, or relative dates of periods and systems with respect to geologic time for your geology class, or any of a hundred other uses...once you get the Pb out!

INTRODUCTORY MARQUEE

Two principles were followed here: show what the program is about by using portions of the program itself; save memory on the frills. All that actually happens is the data is read and printed sequentially until the screen is full. Identifying information is displayed in the center, followed by an appropriate delay loop permitting examination.

```
100 DIMA%(104):CLS
110 FORI=1TO217:READS$:PRINTS$;" ";:NEXT
120 RESTORE
130 PRINT@407,"                    ";
140 PRINT@471,"  E L E M E N T S   ";
150 PRINT@535,"      Q U I Z       ";
155 PRINT@599,"                    ";
160 FORI=1TO5000:NEXT:CLS
```

DIFFICULTY LEVEL

This quiz utility program allows for various levels of difficulty. When composing your own quiz data sets, be sure to order them in ascending levels of difficulty; i.e., the easiest in the beginning and the most difficult last. Absolute precision is not required, so long as the easiest group falls within the first range, and so on. In this group of element information, there are three levels of difficulty ordered alphabetically.

```
200 PRINT@395,"WHAT LEVEL OF QUIZ DO YOU WISH TO TAKE":PRINTTAB(23);
    "EASY       1"
210 PRINTTAB(23);"DIFFICULT   2":PRINTTAB(23);"IMPOSSIBLE  3":PRINTTAB(24);
    "CHOICE";:INPUTL
220 IFL=1 L=40:GOTO1000
230 IFL=2 L=80:GOTO1000
240 IFL=3 L=103:GOTO1000
250 GOTO200
```

Once the level of difficulty is selected, 'L' is set to act as the lower boundry to which data will be read. As written, each level of difficulty includes all the data contained in any easier level. The changes below will isolate each group from the others:

```
230 IFL=2 L=80:U=40:Q=40:GOTO1000
1020.....IFI>U PRINTTAB(0);E$.....
1100 CLS:FORI=Q+1TOL
1110 Z=RND(Q):.....
```

```
1300 FORI=1TOQ:.....
1400 .....FORI=1TOQ:.....
  L=LOWER BOUNDRY U=UPPER BOUNDRY Q=NUMBER OF ELEMENTS
```

QUIZ REVIEW

This section permits the review of the data. The chart heading is placed on a subroutine so it can be used each time the screen is refreshed with a new page of data. The variable 'P' is used as a page-turning control. After every line of information is displayed, 'P' is upcounted 1 until 12 lines have been shown.

```
1000 CLS:PRINT@389,"IF YOU WISH TO REVIEW THE DATA PRESS Y
    ELSE N <ENTER>";:INPUTA$
1010 IFA$="N"GOTO1100
1020 CLS:GOSUB1095:FORI=1TOL:READ E$,S$,N,M$:PRINTTAB(0);E$;TAB(23);S$;
    TAB(34);N;TAB(46);M$
1030 P=P+1:IFP=12 GOSUB1090:P=0
1040 NEXTI:RESTORE:PRINTTAB(20);"REVIEW COMPLETE":GOSUB1090:GOTO1100
1090 PRINTTAB(17);"PRESS ENTER TO GO ON";:INPUTX$:CLS:GOSUB1095:RETURN
1095 PRINTTAB(0);"ELEMENT";TAB(21);"SYMBOL";TAB(35);"#";TAB(45);
    "WEIGHT":RETURN
```

QUESTION SHUFFLER

The approach used to select the questions to be asked is to store numbers in the A array. Those figures determine the number of READ cycles the computer goes through before stopping. Since each READ writes over the information read in the preceding cycles, only the last one is important...and the last one is the question! From there, it's just a matter of making sure every question is asked, and that it's only asked once.

It's usually desirable to change the order in which the data will be quizzed. This is accomplished by using subscripted variables to carry the order in which the questions are asked. To picture this, think of the array (DIMA(104)) as 'so many post office boxes'. The first box A(0) is unused, because doing so has a confusing effect on understanding the rest of the program.

There are two basic methods to filling those boxes with the indicators for which question to ask next: in order with the randomly chosen questions, or randomly picked sequentially chosen questions. The latter is the better choice, by far.

Why? Sticking with our analogy, if you were to randomly choose the questions, you must check all the other boxes to

be sure you haven't already arranged to ask that question. In the case of the element quiz it means checking all the other locations in the array to insure no number is used more than once. By the other method, all that's needed is to check the contents of the box to make sure it's unused (IFA(I))0). That's 10,000 + checks (102 x 102) versus an average of under 1000. It's also easier to program.

If all that confuses you, think of it this way: the post office boxes (array) hold the instructions for the elevator (computer) as to which floor (group of data) to stop at. It is the nature of the READ - RESTORE statements that all preceding data must be reviewed before reaching the final data group — much as an elevator must pass through each floor between ground and destination. I should complete the instruction set analogy by adding that 'RESTORE' is not like a trip down in an elevator ... it's a non-stop trip to the bottom floor (top of the data).

```
1100 CLS:FORI=1TOL
1110 Z=RND(L):IFA%(Z)>0GOTO1110
1120 A%(Z)=I:NEXTI
```

QUIZZING CHOICE

Since the elements quiz data base includes four related pieces of information, several combinations of clue to answer are possible. Twelve possible combinations exist, however, some are rather impractical. How would you like to be given the atomic weight as a clue to guessing the chemical symbol?

```
1200 PRINT@320,:PRINT"      YOU HAVE SEVERAL QUIZING OPTIONS AVAILABLE.":PRINT
1210 A$="ELEMENT":B$="SYMBOL":GOSUB1250:B$=A$:A$="SYMBOL":GOSUB1250
1220 A$="ATOMIC #":GOSUB1250:A$="ATOMIC WGT":GOSUB1250
1230 PRINTTAB(20);"SELECTION";:INPUTX:GOTO1300
1250 C=C+1:PRINTTAB(5);A$;TAB(17);"ASKED FOR GIVING";TAB(37);B$;
     TAB(45);C:RETURN
```

THE QUIZ

Line 1300 goes looking into the aforementioned boxes. 1310 is the elevator travelling down through the floors of data until the last one is saved. This last data set is used by the question/answer set for the actual quizzing process. You may note that line 1320 performs screen maintenance as well as directs the program to the proper question structure. Depending on which quizzing option is chosed (1200 area) the answers are all equated to Q$ so the balance of the program may be used in common regardless of the quizzing structure.

Line 1370 reveals the technique used for both scoring and requizzing. If a question is answered correctly, the A() is zeroed (the post office box is emptied). Line 1300 is set to bypass any question whose answer set is to be found at level zero. In other words, during the requiz only the questions answered incorrectly are asked again. Scoring also uses this feature by searching the array for zeroed elements to determine the total number correct.

```
1300 FORI=1TOL:IFA%(I)=0NEXT:GOTO1400
1310 FORJ=1TOA%(I):READA$,B$,C$,D$:NEXT:RESTORE
1320 CLS:PRINT@455,;:ONXGOSUB1322,1324,1326,1328:INPUT AN$:GOTO1330
1322 Q$=A$:PRINTB$;" IS THE CHEMICAL SYMBOL OF WHAT ELEMENT";:RETURN
1324 Q$=B$:PRINT"WHAT IS THE CHEMICAL SYMBOL FOR ";A$;:RETURN
1326 Q$=C$:PRINT"WHAT IS THE ATOMIC NUMBER OF ";A$;:RETURN
1328 Q$=D$:PRINT"WHAT IS THE ATOMIC WEIGHT OF ";A$;:RETURN
1330 IFQ$=AN$PRINTTAB(25);"C O R R E C T":GOSUB1370:A%(I)=0:NEXTI:GOTO1400
1340 PRINTTAB(20);"THE ACTUAL ANSWER IS ";D$:GOSUB1370:NEXTI:GOTO1400
1370 FORT=1TO1000:NEXTT:RETURN
```

CLEANUP

Provisions for scoring and continuation options are made here.

```
1400 S=0:FORI=1TOL:IFA%(I)=0S=S+1:NEXTI
1410 PRINT@399,"    YOU SCORED";S;" RIGHT OUT OF";L;" FOR";(S/L)*100;"%"
1420 IFS=L PRINT:PRINTTAB(15);"VERY GOOD CARE TO TRY SOMETHING ELSE (Y/N)";
     :INPUTR$:IFR$="Y"GOTO100 ELSE END
1430 PRINT:PRINTTAB(15);"CARE TO TRY THE ONES YOU MISSED AGAIN";:INPUTR$
1440 IFR$="Y" C=0:GOTO1300
1450 S=L:GOTO1420
```

DATA STRUCTURE

In our example (Elements Quiz) there are four pieces of related information. When composing your own application, you may have more or fewer pieces of information. However, each data field must contain the same number of pieces, and the READ statements in lines 1020 and 1310 must be adjusted to correspond to those changes.

```
2000 DATA ALUMINUM,AL,13,27.0
2010 DATA ANTIMONY,SB,51,121.8
2020 DATA ARSENIC,AS,33,74.9
2030 DATA BARIUM,BA,56,137.3
2040 DATA BISMUTH,BI,83,209
2050 DATA BORON,B,5,10.8
2060 DATA BROMINE,BR,35,79.9
2070 DATA CADMIUM,CD,48,112.4
2080 DATA CALCIUM,CA,20,40.1
2090 DATA CARBON,C,6,12
2100 DATA CHLORINE,CL,17,35.5
2110 DATA CHROMIUM,CR,24,52.0
```

```
2120 DATA COPPER,CU,29,63.5
2130 DATA FLUORINE,F,9,19
2140 DATA GOLD,AU,79,197.0
2150 DATA HELIUM,HE,2,4.0
2160 DATA HYDROGEN,H,1,1
2170 DATA IODINE,I,53,126.9
2180 DATA IRON,FE,26,55.9
2190 DATA LEAD,PB,82,207.2
2200 DATA LITHIUM,LI,3,6.9
2210 DATA MAGNESIUM,MG,12,24.3
2220 DATA MANGANESE,MN,25,54.9
2230 DATA MERCURY,HG,80,200.6
2240 DATA NEON,NE,10,20.2
2250 DATA NICKEL,NI,28,58.7
2260 DATA NITROGEN,N,7,14.0
2270 DATA OXYGEN,O,8,16.0
2280 DATA PHOSPHORUS,P,15,31.0
2290 DATA PLUTONIUM,PU,94,(242)
2300 DATA POTASSIUM,K,19,39.1
2310 DATA SILICON,SI,14,28.1
2320 DATA SILVER,AG,47,107.9
2330 DATA SODIUM,NA,11,23.0
2340 DATA SULFUR,S,16,32.1
2350 DATA TIN,SN,50,118.7
2360 DATA TITANIUM,TI,22,47.9
2370 DATA TUNGSTEN,W,74,183.9
2380 DATA URANIUM,U,92,238.0
2390 DATA ZINC,ZN,30,65.4
2400 REM SOURCE - ASSOCIATED PRESS
     ALMANAC, - 1975
2500 DATA ACTINIUM,AC,89,227.0
2510 DATA AMERICIUM,AM,95,243
2520 DATA ARGON,AR,18,39.9
2530 DATA ASTATINE,AT,85,(210)
2540 DATA BERKELIUM,BK,97,249
2550 DATA BERYLLIUM,BE,4,9.0
2560 DATA CALIFORNIUM,CF,98,(251)
2570 DATA CERIUM,CE,58,140.1
2580 DATA CESIUM,CS,55,132.9
2590 DATA COBALT,CO,27,58.9
2600 DATA CURIUM,CM,96,(248)
2610 DATA EINSTEINIUM,ES,99,(254)
2620 DATA FERMIUM,FM,100,(253)
2630 DATA FRANCIUM,FR,87,(223)
2640 DATA GALLIUM,GA,31,69.7
2650 DATA GERMANIUM,GE,32,72.6
2660 DATA IRIDIUM,IR,77,192.2
2670 DATA KRYPTON,KR,36,83.8
2680 DATA LANTHANUM,LA,57,138.9
2690 DATA LAWRENCIUM,LR,103,(257)
2700 DATA MENDELEVIUM,MD,101,(256)
2710 DATA MOLYBDENUM,MO,42,95.9
2720 DATA NEODYMIUM,ND,60,144.2
2730 DATA NEPTUNIUM,NP,93,(237)
2740 DATA NOBELIUM,NO,102,(254)
2750 DATA OSMIUM,OS,76,190.2
2760 DATA PLATINUM,PT,78,195.1
2770 DATA POLONIUM,PO,84,210.0
2780 DATA RADIUM,RA,88,226.1
2790 DATA RADON,RN,86,222.0
2800 DATA SELENIUM,SE,34,79.0
2810 DATA STRONTIUM,SR,38,87.6
2820 DATA TANTALIUM,TA,73,181.0
2830 DATA TECHNETIUM,TC,43,(99)
2840 DATA THALLIUM,TL,81,204.4
2850 DATA THORIUM,TH,90,232.0
2860 DATA VANADIUM,V,23,51.0
2870 DATA XENON,XE,54,131.3
2880 DATA YTTERBIUM,YB,70,173.0
2890 DATA ZIRCONIUM,ZR,40,91.2
3000 DATA DYSPROSIUM,DY,66,162.5
3010 DATA ERBIUM,ER,68,167.3
3020 DATA EUROPIUM,EU,63,152.0
3030 DATA GADOLINIUM,GD,64,157.3
3040 DATA HAFNIUM,HF,72,178.5
3050 DATA HOLMIUM,HO,67,164.9
3060 DATA INDIUM,IN,49,114.8
3070 DATA LUTETIUM,LU,71,175.0
```

```
3080 DATA NIOBIUM,NB,41,92.9
3090 DATA PALLADIUM,PD,46,106.4
3100 DATA PRASEODYMIUM,PR,59,140.9
3110 DATA PROMETHIUM,PM,61,(147)
3120 DATA PROTRACTINIUM,PA,91,231.0
3130 DATA RHENIUM,RE,75,186.2
3140 DATA RHODIUM,RH,45,102.9
3150 DATA RUBIDIUM,RB,37,85.5
3160 DATA RUTHENIUM,RU,44,101.1
3170 DATA SAMARIUM,SM,62,150.4
3180 DATA SCANDIUM,SC,21,45.0
3190 DATA TELLURIUM,TE,52,127.6
3200 DATA TERBIUM,TB,65,158.9
3210 DATA THULIUM,TM,69,168.9
3220 DATA YTTRIUM,Y,39,88.9
4000 FORI=1TO37STEP4:LPRINTI;A%(I),
     I+1;A%(I+1),I+2;A%(I+2),I+3;
     A%(I+3):NEXTI
```

PROGRAMMING HINT for TRS-80 Disk Users

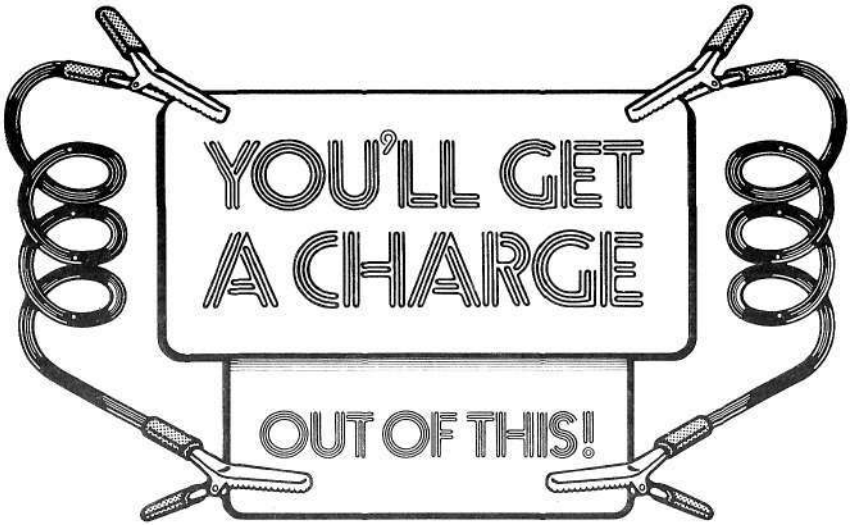
If your disk drives give you frequent READ errors, this may be very helpful. Disk drives are very sensitive to radio noise. Put an AM radio next to your expansion interface cable and run something. That's radio noise.

If your disk drive sits next to the expansion interface on the left side, chances are that's the drive with all the READ errors. There's nothing wrong with the drive. It's just picking up all that radio noise and the interferance between that and reading the disk is driving it crazy.

There are two ways to cure this. One is to move the disk drives away from the expansion interface. The second method takes a bit more work. It seems that the metal chassis of the disk drive isn't grounded. So, find one of the ground lines on the disk drive cable that goes back to the expansion interface, and, using a piece of wire, ground the chassis to the computer common ground. Don't use AC ground. You **must** use the ground line that goes back to the computer.

This problem does not seem to crop up is the drive is on the right side of the expansion interface. But those power supplies, with their big magnetic fields are there to start erasing data on your disks if you're not careful.

Another problem associated with disk drives is not a disk drive problem at all. The power supply for the expansion interface is very sensitive to AC power glitches. Mine likes to clear memory when my refrigerator goes on. Radio Shack has a modification to the expansion interface that cures this problem. (Check with your store manager for details. The modification is free.)



RADIO SHACK OPENING MODULARIZED STORES

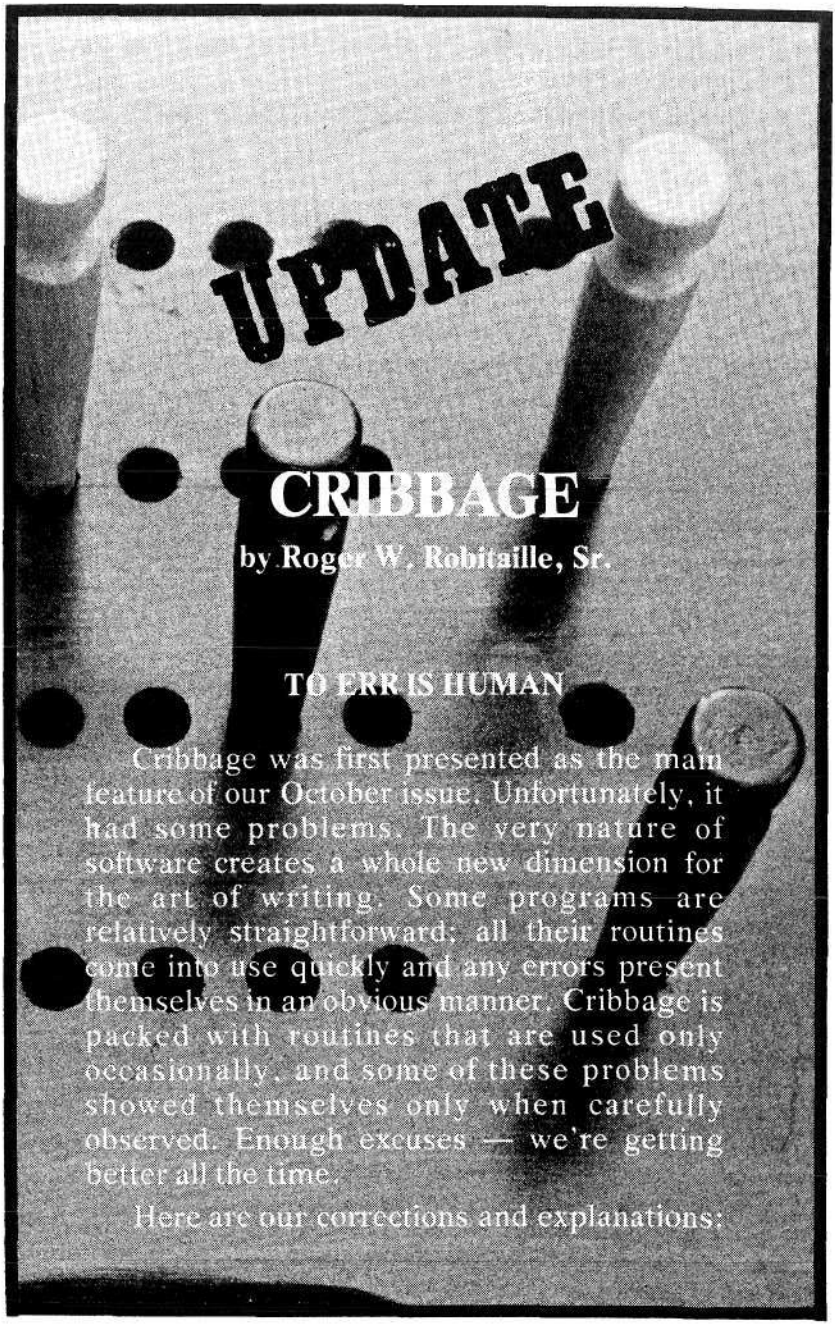
FORT WORTH, Texas — By the end of this week Radio Shack will have opened three modular concept stores which will feature separate department layouts for the company's three newest product lines in addition to standard Radio Shack products.

A computer department will be included in these "Super Shacks", as one spokesman dubbed the store concept. "The modular area in the three new retail locations is not the same as the design or purpose of the Radio Shack Computer Centers we are opening in major markets," Radio Shack President Lewis Kornfeld said.

The modular concept stores will not carry the complete line of computer products offered by the centers, but will rather stock the more popular products. Some customers already know what computer products they want to purchase and do not require the full depth of expertise the Computer Center Stores offer.

While the company is not sure of the modular stores' final effect, the concept was designed to attratct business, the spokesman said. The three stores will be located in New York, Washington, D.C. and Chicago.

Meanwhile, the company is also gearing up to establish fifty Radio Shack Computer Centers by the end of May, the spokesman said. To date, seven centers are in operation. — **COMPUTERWORLD**, 12-11-78



CRIBBAGE

by Roger W. Robitaille, Sr.

TO ERR IS HUMAN

Cribbage was first presented as the main feature of our October issue. Unfortunately, it had some problems. The very nature of software creates a whole new dimension for the art of writing. Some programs are relatively straightforward; all their routines come into use quickly and any errors present themselves in an obvious manner. Cribbage is packed with routines that are used only occasionally, and some of these problems showed themselves only when carefully observed. Enough excuses — we're getting better all the time.

Here are our corrections and explanations:

```
1301 PRINT@338,"THIS IS YOUR HAND  ";:IFZ=1PRINT"(IT IS YOUR KITTY)
1348 ONINT((A(I)-1)/13)GOTO1365,1370,1375
1504 PRINT@100,V;:PRINT@325,"YOUR SCORE";A(14),"  COMPUTER SCORE";A(15)
1505 PRINT@599,"PLAYED CARDS
1506 B=0:I=60:D=C:X=724:GOSUB1330:RETURN
2302 A(N+200)=A(N+200)+1:IF(Q=1)+(Q=3)THENA(N+200)=A(N+200)+1
2303 A(214)=A(201):IFQ<2GOSUB2270
2500 ONINT((A-1)/13)GOTO2530,2540,2549
2530 E=13:F=27:GOTO2550
2600 PRINT:INPUT"WHICH CARDS DO YOU WISH TO PUT INTO THE KITTY (#,#)";A,B
2635 IFX=10IFINT(A(I)/13)=INT((A(13)-1)/13)GOTO2637
2660 PRINT@778,;:INPUT"WHICH CARD DO YOU PLAY(0=GO)";A:IF(A>4)+(A(0)GOTO2660
2689 IF(T>3)*(C>3)Q=0+1:T=0:Q=3:N=A(C+47):GOSUB2300:IFT>40=0+1
2730 A=-10:FORI=71TO74:IFA(I)>ATHENN1=I:A=A(I)
2732 A=N1-30:N1=N1-40:V=V+A(A)
2742 IFA(N1)=A(C+50)T=T+2:IFA(N1)=A(C+49)T=T+4:IFA(N1)=A(C+48)T=T+6
2750 C=C+1:A(C+50)=A(N1):A(C+60)=A(N1-10):A(N1)=0:A(A)=0:A(A-20)=0
2983 IFZ=1PRINT"PLAYER CUTS JACK":T=2:GOSUB2915:RETURN
3036 PRINT:PRINT:PRINT"     YOUR HAND","COMPUTER HAND","  KITTY HAND","CUT CARD
3037 X=577:D=4:I=4:B=0:GOSUB1330:X=591:D=4:I=0:B=0:GOSUB1330
3038 X=607:D=4:I=8:B=0:GOSUB1330:X=624:D=1:I=12:B=0:GOSUB1330:PRINT@847,"";
3039 GOSUB10000:IF((A(14)>120)*(Z=2))+((A(14)>120)*(A(15)<121))GOTO2960
3040 IF((A(15)>120)*(Z=1))+((A(15)>120)*(A(14)<121))GOTO2950
```

Lines 1301, 1504, 1505, 1506, 2600, 3036, 3037, 3038

Essentially cleans up displays — OPTIONAL

Lines 1348, 2500, 2635

These changes correct a problem in suit detection. Remembering that the A( ) values of 1-13 represent the club suit, the method of extracting that fact was to divide that value by 13 and draw the integer value of that result, yielding 0 for clubs, 1 for diamonds, etc. Well, so I thought ... works fine for everything but aces. You see, 13 divided by 13 equals 1 — integer value still 1 (diamonds, not clubs). The answer was to offset the A( ) by -1. Sorry, folks.

Lines 2302, 2303, 2689

The problem here is less obvious. During computer hand selection and meld determination, detection of pairs and straights was tied together for convenience (GOSUB 2770?). Well, that's fine when the hand is

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dealt as a whole, however, during play the straight detection must be isolated so that points resulting from pairs won't be misinterpreted as successful straight detection. Mode 3 (Q=3) is used for this occasion.

Line 2303

The corrected line still includes A(214)=A(201). If you wish to play 'according to Hoyle', delete that equation. Hoyle doesn't support my assumption that aces may be used at either end of the suit for straights.

Line 2660

The reference to line 2661 was **a mistake**; remember, we're all human, right? Anyway, the easiest answer is to have the default back to itself. Alternatively, you put a subroutine announcing that the player has made an erroneous input (Please select 1-4), and return back 2660 for a proper input.

Lines 2730, 2732, 2742, 2750

This program was originally written in Level I, with the limitation to 26 lettered variables. As a result, they often served multiple uses. Well, the short of it is the variable N was assigned two uses **at the same time** with resulting confusion when the computer places the fifth in play (activating the second use of N). Answer? Relabel one of the uses of N to N1. (Level I folks use A(16)).

Line 2983

Coding error here. Z flags who has kitty and who gets credit for the cut Jack (Not E).

Line 2530

Coding error, again. The range allowed for the diamond suit was made too large.

Lines 3039, 3040

Here again, it's a matter of conforming to Hoyle. 121 wins, not 120. The changes correct the problem.

HAM RADIO

by M. Kelleher

If you're into Amateur Radio, whether tickling your neighbor on QRP or rocking Gibralter with a "California Kilowat", this powerful Level II 16K program can put a lot more fun into your hobby — and that's what it's all about, isn't it?

Here are a few of the features:

•Amateur Frequency Allocations

Frequency, Mode, and Licensing requirements for 80, 40, 20, 15, 10, 6 and 2 meter bands

•ID Timer

Counts down to next station ID and issues prompt using manual reset or automatic timer functions

•Q Signal File

Complete Q Signal file at your fingertips

•Propagation Forecasting

Computes radio wave propagation conditions when given current Solar Flux Index and current K-index

•Amateur Log Routine

Stores to tape log of station activity by Callsign, Date, RST, Mode, QTH and other information, and permits review of previously recorded Log tapes

Available for Level II, 16K — $9.95

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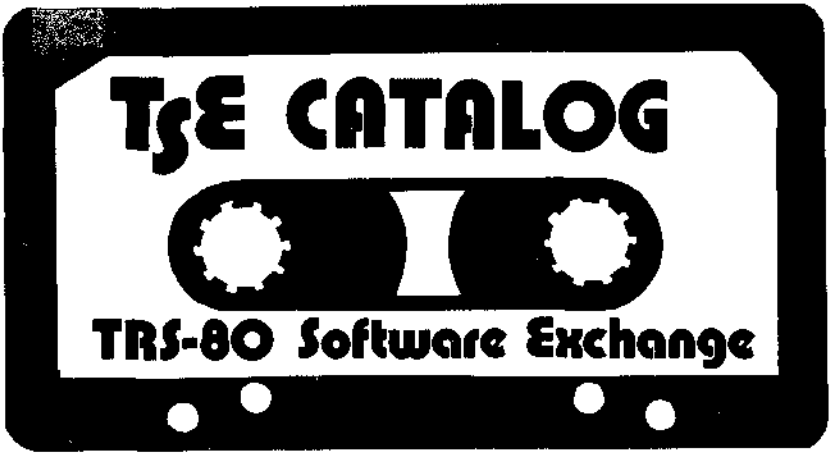

Games

MASTERMIND II [Version 2.1] By Lance Micklus
Many TRS-80 programs have been written to play digital Mastermind. But they would only let the computer make the codes, and the human break the codes. Our version of the classic game lets you and the computer take turns making and breaking codes so you can both play. This program is a beautiful example of the speed of the Z-80 cpu. The computer takes less than 3 seconds to make a guess, and will usually figure out a code on the 5th guess. It's uncanny! The secret is that it is written in machine language, not BASIC. We supply you with an object tape which loads in addresses 7600 to 7FF0 using the SYSTEM command. It is also DOS compatible. Thus, the object code may be stored on disk using TAPEDISK and executed under DOS from disk. If you like to play challenging games of logic, we strongly recommend this one. For 16K Level II machines.

Level I or II, 16K Price, $7.95

MSTRSI [Version 2.1] by Lance Micklus
If you're interested in machine language programming, then you'll want to buy the EDITOR/ASSEMBLER listing of MASTERMIND II. Includes comments and symbol table using Z-80 Zilog Assembly language. **Source Listing** Price, $20.00

TIME BOMB by David Bolke
Somewhere inside a towering skyscraper, a time bomb is ticking away. Your mission: locate the explosive device in this maze-like structure and disarm it within a given time.

Level I or II, 16K Price,$4.95

TROLL'S GOLD by Rev. George Blank
A chase game for children of all ages. The troll is deep within the caves, guarding his gold. Your aim is to descend to his lair and escape with the booty without him capturing you. For Level II, 16K Price, $4.95

GAME OF LIFE by Small System Software
A game of birth, growth and death of a colony of cells. Enter any patters (4 furnished) with unique repeating keyboard, then save on tape. A fast, machine language program (about 1 second per generation). Price, $14.95

ROBOT by Lance Micklus
Struggle to keep your wits about you as an army of robots stalk you through a seemingly endless maze. It's you against them as you simultaneously seek to avoid and trick them into their trap.

Level II, 4K Price, $4.95

ADVENTURE by Scott Adams
You'll feel as if you're manipulating **HAL**, the infamous computer from the movie **2001: A Space Odyssey** when you play this game. Hardly any rules, finding out is part of the game — or is it a game. Two adventure situations — pirate and land on one diskette.

For Disk Only 32K — $24.95

TREASURE HUNT by Lance Micklus
Explore caves in search of 20 treasures. Some are easy to get, others very difficult because you have to figure out how. The more you play, the more secrets you discover, the more treasure you will find. All 20 treasures can be found in about an hour of play if you know what you're doing. First problem: draw a map of the caves. To save you time, however, a map is enclosed. Good luck, you'll need it. Level I or II, 16K Price,$7.95

CONCENTRATION by Lance Micklus
In the 1960's, one of the most popular TV game shows in history appeared on the air. "Win campers or boxes of nails, gifts galore, but take the chance of forfeiting them later in the game". Most of all, concentrate on where the items are on the play board.

Level I or II, 16K Price, $4.95

PORK BARREL by Rev. George Blank
Put yourself in the shoes of an aspiring Congressman. Given a breakdown of your constituency by percentages: white collar, retired, farm worker, unemployed, welfare, blue collar, elderly and many more, how would you vote on various sensitive issues? In this game, you get to put your vote where your mouth is. Don't worry, the voters in your district will let you know how they feel! Level II, 16K Price,$9.95

'ROUND THE HORN by Rev. George Blank
You are the captain of a sailing ship racing from New York to San Francisco. You must attempt to find favorable winds and currents which will provide the most expeditious route around South America through the Straits of Magellan. Superb graphics!

Level II, 16K Price,$9.95

SANTA PARAVIA EN FIUMACCIO by Rev. George Blank
Capsule simulation of economic life in a 15th century Italian city-state. Object of the game is to build your feudal holdings into a kingdom, progressing upwards to higher levels of nobility, ultimately to reach coronation before death. Four levels of difficulty — Apprentice, Journeyman, Master, Grand Master. Level II, 16K Price,$7.95
THIS PROGRAM WILL ONLY BE AVAILABLE UNTIL MARCH 31, 1979. **Reg. $9.95**

KENTUCKY DERBY
Place your bets and urge your favorite horse on to thrilling victory in this exciting race program. Level I or II, 4K Price, $4.95

BREAKAWAY by Lance Micklus
A challenging real time action game of skill and dexterity. All the excitement of a traditional pinball machine without the added expense. You control speed and direction of the ball as you try to "break away" the playing field. Level I or II, 4K Price, $4.95

STAR TREK III by Lance Micklus
One of the most advanced Star Trek type games ever written. Object of the game is to explore as much of the galaxy as possible, destroy the 20 Klingons and locate the 5 Class M planets. Exploration facet of the game gives it a whole new dimension. Extensive use of graphics, including a 3-dimensional galaxy. During a Klingon battle you see the phasers fire, hit the Klingons and explode. Hazards to be aware of are large stars, black holes and a pulsar. Pulsar makes space noise in adjacent quarters where the Klingons are hidden. Docking must be controlled to avoid collision or docking failure. At game's end you return to Star Fleet Headquarters where collected data is evaluated by your ship's computer and your performance is rated. Takes about 2 hours to play a game.
Level II, 16K Price,$14.95

X-WING FIGHTER by Rev. George Blank
Looking for more realism in Trek-type programming? Put yourself in the cockpit of this fighter. Extensive use of the INKEY function puts all of the ship's controls at your fingertips **without** hitting the ENTER key. Long range sensors warn of approaching aircraft prior to visual contact. After sighting, their size increases with proximity. Level II, 16K **Price,$7.95**

AIR RAID: by Small System Software
High speed machine language program with large and small aircraft flying at different altitudes. Ground-based missile launcher airmed and fired from keyboard. Planes explode when hit, sometimes cause damage to nearby aircraft. Score tallied for hits or misses, then saved for challenge by another player.
Level I or II, 4K Price, 14.95

PILLBOX by Gene Perkins
A simulated artillery battle between two fixed emplacements. A two-player game, each person controls the angle of fire and muzzle velocity of the shell. The game places a mountain between the warring batteries and lets the laws of physics take over.
For Level I and Level II, 4K **Price,$4.95**

TEN PIN by Frank Rowlette
High speed graphics superbly presented in this simulation of the great indoor sport. A game of coordination, the scoring is true to the rules of the sport. Computer keeps score for one or two players. Records spares, strikes, splits, open frames.
For Level II, 16K Price, $7.95

END ZONE by Roger W. Robitaille, Sr.
Authentic football simulation, right down to the 2-minute warning. Played in four 15-minute quarters. Level I or II,16K Price,$7.95

ZONE HOCKEY by Michael Flanagan
A very interesting game with a graphics orientation. Designed for two players, the offensive player attempts to maneuver into zones close to the goal for a shot, while the defensive player attempts to anticipate those maneuvers. Scorekeeping and periods accounted for according to number of keyboard plays entered.
Level I, 4K Price, $4.95

SLALOM by Denslo Hamlin
A real time action program. Choose between the Slalom, Giant Slalom and downhill courses. Be fast — but don't get hurt — or worse . . . . Level II, 16K Price, $7.95

3-D TIC TAC TOE by Scott Adams
Everyone knows this game, but how about a 4 x 4 x 4 version? Three skill levels for computer competition — author warns you to practice before tackling the computer's third skill level. Level I and II, 16K Price,$7.95

CHECKERS by Don Mc Allister
All you need to have an ever-ready checkers opponent is a Level I machine with 4K of memory. A surprisingly fast and competitive program written in BASIC. For Level I, 4K systems Price, $4.95

CRIBBAGE by Roger W. Robitaille, Sr.
A "you versus the computer" cribbage, played by the standard rules. Computer shuffles, deals, keeps score and wins ... unless you're careful. Feature in October **SoftSide**. Level I or II, 16K Price,$7.95

BRIDGE CHALLENGER by George Duisman
You and the dummy play 4-person Contract Bridge against the computer. The program will deal hands at random or according to your criterion for high card points. You can review tricks, swap sides or replay hands when the cards are known.
Level II, 16K Price, $14.95

SARGON by Dan & Kathe Spracklen
The recent winner of the 1978 San Jose Microcomputer Chess Tournament, SARGON, Kathe and Dan Spracklen's revolutionary chess-playing program, left spectators slackjawed as it soundly defeated a formidable field of challengers.
Level II, 16K Price, $19.95

SARGON: A COMPUTER CHESS PROGRAM by Dan & Kathe Spracklen
Complete documentation covering all algorithms in SARGON (above) is found in this guide book. Contains a complete table of contents, block diagram of the program, a 4-part introduction, Z-80 listing and index to subroutines. Fully annotated. Price, $14.95

MICROCHESS by Peter Jennings
The culmination of two years of chessplaying program development by Peter Jennings, author of the famous 1K byte chess program for the KIM-1. **MICROCHESS 1.5**, in Z-80 machine language, offers 3 levels of play (both Level I and Level II versions are included and can be loaded on any TRS-80 without TBUG.) Every move checked for legality and current position displayed on a graphic chessboard. You can play White or Black, set up and play from special board positions, or even watch the computer play against itself!
Level I or II, 4K Price, $19.95

CHESS COMPANION by M. Kelleher
Combines chess clock features with the ability to record your moves while the action is fast and furious. The moves listing may be reviewed at any time.
Level II, 16K Price, $7.95

BACKGAMMON by Scott Adams
A completely different program which is just waiting to beat you! And it plays a pretty mean game. Level II, 16 K Price, $7.95

Business

INVENTORY MANAGEMENT FP by M. Kelleher
Handles up to 100 stock items with primary and backup vendor. Allows for stock on order and date of last shipment received information. All information, including character strings, is contained in subscripts and thus recordable separately from the program. Two programs are included on one cassette (Initialization and Maintenance) If your inventory exceeds 100 stock items, it should be a simple matter to segregate stock into logical subdivisions with separate data files. Level II, 16K Price, $25.00

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INVENTORY [MODULAR] by Roger W. Robitaille, Sr.
Construction of this program permits the user to create subroutines customized to his own purpose. Allows for the inclusion of Alphabetic information and a Data Index Code in the form of data statements within the program. Performance and flexibility unmatched by our other inventory software. **Detailed Report, Reports, Cost/Value Summary, Reorder Search, Index, Read and Write File, Data Change.**

Version I 240 stock items can be contained using the full 8 data areas and 2 pieces of alpha information
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A Level II diskette-based program which allows for creation, maintenance and review of over 2,000 items per clean diskette. Operates under Radio Shack Disk BASIC, DOS 2.1 with minimum memory allocation of 16K RAM. Utilizes random files with 6 subrecords per random file buffer, allowing for maximum utilization of diskette space.
For Disk Only **Price, $59.95**

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A random file method of data storage designed for comprehensive inventory control of up to 340 separate items per clean diskette. Any number of disk drives may be utilized with this system.
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Allows for the creation of up to 200 files with account name, invoice number, payment date and balance. Updates files and stores to tape. Offers complete aging data and reveals delinquent accounts. Level II, 16K Price, $25.00

ACCOUNTS RECEIVABLE by Michael Kelleher
For any small to medium volume business operation requiring sophisticated control of accounts receivable. Based on Radio Shack BASIC for diskette operation DOS 2.1. Utilizes a random file method of data management. Maintains up to 329 separate ledgers on each clean disk. Optimum system has been designed to operate with two disk drives, however the system has been designed to operate with a single drive also.
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SMALL BUSINESS BOOKKEEPING by Roger W. Robitaille, Sr.
National Distributing Co. has been selling the **Dome Bookkeeping Journal** for scores of years through stationery and discount stores. This program is compatible with that journal. As is appropriate with any business application, we assume no liability in regards to the use of this progam. The user is expected to assess it based upon its performance as observed. It's not that we don't believe in it, it's just that the conceivable liability for its use (or misuse) is so staggering you just plain use it at your own risk, or don't use it at all. Available with or without Dome Bookkeeping Journal. Level I or II, 4K
With Journal — Price, $22.00
Without Journal — Price, $15.00

FILE HANDLING by Circle Enterprises
A must for file handling in BASIC. Will list names in file, search/edit file, record file on cassette. One use would be to record names and phone numbers, either one callable by the other. Level II, 16K Price, $9.95

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CASH REGISTER by Roger W. Robitaille, Sr.
If you've considered adding a small computer to your business, whether for inventory management, business accounting or any of the hundreds of other useful applications, here's one more reason to do it today. This program has 12 customizable departments, can store up to 300 sale events by department and amount, shows a daily sales report and performs a cash-out routine. It can even be used with a screen printer to furnish receipts. Level I or II, 4K Price, $10.00

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Special Purpose

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HAM RADIO by Michael Kelleher

If you're an amateur radio buff, this powerful program can put a lot more fun into your hobby. A few of the features: Amateur Frequency Allocations, ID Timer, Q-Signal File, Propagation Forecasting, Amateur Log Routine (stores to tape log of station activity by Callsign, Date, RST, Mode, QTH and other information; permits review of previously recorded log tapes. Level II, 16K Price, $9.95

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Twenty-two commands interact directly with Z-80 processor. Examine ROM's, test RAM, enter and execute machine language programs, read and write SYSTEM tapes, enter Z-80 BREAKPOINTS. SYMBOLIC DUMP disassembles object code and displays as Zilog standard mnemonics. Memory may be displayed in HEX or two ASCII formats and can be EDITED, MOVED, EXCHANGED, VERIFIED, FILLED, ZEROED, TESTED, or SEARCHED for one or two-byte codes. Continuous or one-line at a time memory dumps. Level I or II, 16K Price, $26.95

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Contains 3 versions on a single disk to load into 16K through 48K TRS-80's with disk systems. Read your TRSDOS into memory using DISK read command, print disassemble listings with SYMBOLIC dump and printer output command, then modify and rewrite to disk using DISK write command.

Price, $29.95

MICRO TEXT EDITOR by Don Coons
Versatility in text composition and editing through use of a non-destructible cursor, graphics capability and interface option with cassette tape or either TRS-80 printer. Commands include: Delete, Insert, ASCII Code, Repeat, Print, Save, Load, Clear, End. Level II, 4K or 16K Price, $9.95

8080-Z80 CONVERSION by M. Kelleher
What can we say! For you machine language buffs, here is a program which permits you to enter 8080 codings and the program will return the Z-80 equivalent. It will also store these equivalents in the order in which they were entered, for later review. For Level II, 16K Price, $15.00

BASIC STATISTICS by Steve Reisser
This powerful set of procedures is of use to students, instructors, behavioral and research scientists, statisticians — anyone using rand. order, central tendency, Pearson product-movement correlation coefficient, chi-square, Fisher T-test, sample analysis of variance, Z-scores and standard scores, with a random number generator built in to simulate data. Level II, 16K Price, $20.00

RENUMBER by Lance Micklus
This program can renumber a 12K program in just 32 seconds. Complete user control with respect to which lines are renumbered, and how, including all GOSUB's and GOTO's. Runs in 1300 bytes of high memory regardless of program size. Specify 4, 16, 32, or 48K version when ordering. For Level II Price, $15.00
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All 4 versions on DISK Price, $25.00

Personal

HOME FINANCIAL MANAGEMENT by M.D. Kelleher
Turns your computer into a personal financial advisor. Easy to use, yet complete enough to be of real use. Features include: Loan payment amount, savings balance, dividends and withdrawals, earned interest rate, true cost of automobile, budget, cost of borrowing, balance of loans still owing, probability of obtaining a loan, plus more! For Level II, 16K Price, $9.95

PERSONAL FINANCE by Lance Micklus
This is a 2 program package. Checkbook is used to maintain your checking account and Checkfinder maintains a file of all your cancelled checks. Thirty-three different budgets can be set up to assign each check to. The budget names are in DATA statements at the end of both programs so they may be easily changed by the user to fit his individual needs.

Checkbook includes a test data generator which may be used to demonstrate the program, or to make test runs on the program without the need to use real checks. The menu format makes it easy to change functions, and the program is human engineered to require the least number of keyboard actions. The design of the program is such that human error is minimized. Besides maintaining a balance, the program will justify your account against the bank's monthly statements. There's even a bill estimator to help you decide who gets paid this month.

Checkfinder gets the cancelled checks from a data tape generated by the Checkbook program, and builds a cancelled checks file. It will locate cancelled checks for you and total the amount of all checks found. So, if one of your budgets was alimony, it will locate every alimony check that came back from the bank. Really impresses the IRS. A modified bubble sort will rearrange the file in memory and save it on tape. Checkfinder will store 900 checks in memory on a 16K machine. We assume no liabilities regarding the use of these programs.

Level II, 16K Price, $9.95

MICRO TAX 78 by George Clisham
Just in time to help you prepare your 1978 Federal Tax Return. Includes 6 programs to aid in optimizing your '78 return. Completes form 1040 along with schedules A, B, C, D, and SE. With full user instructions. Level II 16K Price, $12.95

MICRO TAX 78 MINI PAC by George Clisham
The same program as above, but only completes Form 1040 and Schedule A. Makes short work of long forms. Level II 16K Price, $7.95

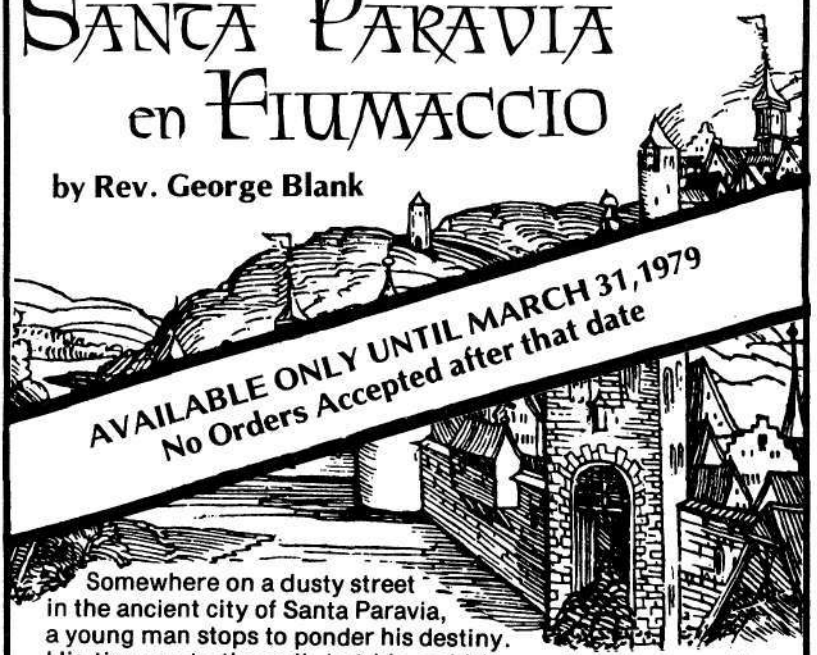
CALCULATOR by Roger W. Robitaille, Sr.
Allows the TRS-80 to function as a calculator with one key function codes and the ability to carry totals. The four basic arithmetic functions are included along with the reciprocal, memory storage and retrieval, and reverse sign. Level I or II, 4K Price, $2.95

BIORHYTHMS by Frank B. Rowlett, Jr.
There is a theory that everyone is subject to a group of life cycles which affect their daily lives. The rates of the cycles are mathematically fixed, and lend themselves to computer analysis. This program unravels those interrelated formulae into a meaningful graphic representation for you to interpret. Runs in Level I or II, 4K Price, $4.95

TAROT by Frank B. Rowlett, Jr.
Probably the best future-gazine type program ever. Unlike many programs whose appeal wears out quickly, the combination of graphics and presentation leads to continuing use. Try it — you'll like it! Level I or II, 16K Price, $9.95

SANTA PARAVIA en FIUMACCIO

by Rev. George Blank



Somewhere on a dusty street in the ancient city of Santa Paravia, a young man stops to ponder his destiny. His ties are to the soil, but his ambitious nature is compelling him to loftier pursuits. He wipes the sweat from his brow and mutters under his breath, "One day, I will be King".

That person could be you in this economic simulation of life in a 15th century Italian city-state. From one to five players struggle to win the leadership of their respective states through a combination of public works, manufacturing, land acquisition, and of course, staying on the good side of the church. You can make your state grow as a manufacturing center, a farming community, or as a combination of the two as long as you follow the rules of the day.

Furnished with complete set of instructions and hints on game strategy. Level II 16K cassette — ~~$9.95~~

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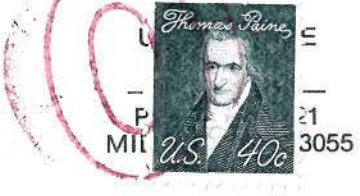
JIGSAW — Puzzle program for all ages

PERSONAL FINANCE [Part I] — Checkbook program with appealing graphics

DIVE BOMBER — Sea/air combat — real time ACTION

SIMPLE SIMON — Monitor disassembler written in BASIC

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