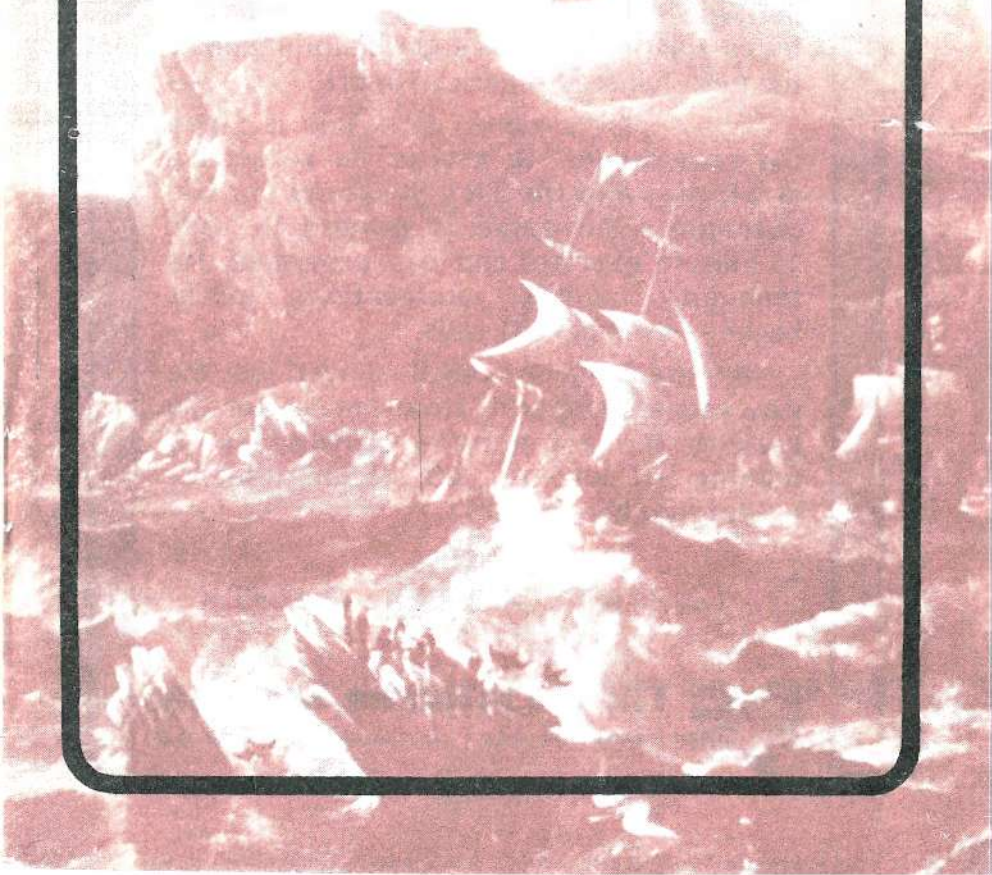
January 1979

$1.50

SoftSide™

"your BASIC software magazine"

'ROUND the HORN



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SoftSide magazine is continually seeking original articles and software for publication. Imagination and variety in concept and content are the rules at **SoftSide** — not the exceptions. Articles are purchased on a per-page basis, based on content and applicability. Our policies with respect to software purchase are highly individualized, and offer the programmer several options, including one-time publication rights, outright purchase, and royalties on sale of pre-recorded cassettes. For more information, please write: **SoftSide**, PO Box 68, Milford, NH 03055.

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.

SoftSide magazine is published monthly by SoftSide Publications, 17 Briar Cliff Dr., Milford, NH 03055 Telephone: 603-673-5144. Editorial and Advertising offices at PO Box 300, Harrisville, NH 03450 Telephone: 603-827-3038. Subscription rates in U.S. and Canada $15 per year/$28 for two years; international rates $27 per year/$48 for two years; all remittances payable in U.S. funds. Mail all subscription inquiries to: **SoftSide Subscriptions**, PO Box 68, Milford, NH 03055.

Just to Let You Know ...

May/December SoftSide ?

No way, but with the magazine growing, both in circulation and actual number of pages per issue, we do seem to have gotten somewhat behind. In fact, if it weren't for the never-ending stream of encouragement and constructive criticism, we would probably all be seeking less demanding occupations — like training lions or mediating arms disputes. But that's our problem and one we attack with relish. Fear not! We said twelve issues and we mean twelve issues; and with the promise of increased staff, we'll soon be back on track with a continually improving SoftSide.

Tape Measures

In the last issue, we announced the availability of SoftSide programs on cassette. The ensuing response left us wondering why we didn't start with Issue One. More than 50% of you would opt to part with the greenbacks and leave the codings to us. Some were more conditional in their approval, balking mostly at laying out $60 in one lump sum, asking instead that the one-year subscription price of $60 be broken into two 6-month subscriptions at $30. It seems that it's easier to part with $30 twice than $60 once, so the 6-month subscriptions have been made available. Those readers who struck nix in the cassette box cited everything from preferring to buy selectively to an unlimited supply of underemployed grandchildren. The best reason we read for going the keyboard route was that it's simply the best way to learn. That it is !

Meanwhile, the rest of you with double vision or cramped schedules, don't procrastinate! The first edition of cassette SoftSide will be limited to 300 copies, with orders filled on a first come-first served basis. Subsequent editions will be produced at a small percentage over actual demand at time of order, with **no backorder cassette sales**. Since our agreements with program authors include the subsequent sales of their wares on cassette, it's easy to see how back issue sales at the subscription price would undermine the programs' after-market.

continued

So, those of you who love grab bags, subscribe now. You'll be glad you did, or your money will be somewhat less than cheerfully refunded.

Business vs. Recreation

Another condition revealed by our survey was the definite split between those who want to use their computer for business, and those who see SoftSide as the foremost source for interesting and increasingly complex games, which prompted some serious soul-searching on our part. It's clear that both centers of interest need to be served. It's equally clear that to try and do so within the pages of one magazine would certainly work to the detriment of one or the other. Even further, consider the user who's interested solely in what the computer is doing as opposed to how it's doing it — the consumer vs. the programmer. Now, how is a successful magazine to serve all three masters well?

PROG-80, BIZ-80

The above names are the tentative titles of our immediate solution. From the outset, SoftSide was conceived as a means of providing inexpensive software to the consumer. With the increasing quality and complexity of the games and simulations slated for publication, the required instructions, strategies, historical notes, ectc. will more than fill SoftSide's pages 'till the sun shall fail to rise. So, SoftSide will continue to grow along just those lines.

TRS-80 HOTLINE

If you ever find yourself in need of some fast answers, an easy solution or just a sympathetic ear, call **SoftSide's TRS-80 HOTLINE**. From 7 to 8, every Tuesday evening (EST), our resident software editor will be "on line" to offer BASIC programming assistance to Level I and II TRS-80 users in need of a fix.

HOTLINE **603-673-5144**

BIZ-80 (name subject to change without notice) is scheduled for launch shortly, and as you may have guessed, will be aimed at the businessman. Not a magazine at all, but an ongoing series of software and bulletins, BIZ-80 will seek to provide a sound basis for centering the TRS-80 in a business environment, and will address itself to two systems: the 32K single disk (with allowances for additional drives) and the 16K Level II stand-alone with no peripherals. It will take some time for BIZ-80 to realize it's full potential, but from the outset, certain basic pieces of software will be made available to provide the underpinnings (disk payroll, receiv-

TRS-80 Programming Hint

This routine writes data on tape with a blinking star in the upper left-hand corner of the screen. Line 110 makes the star turn on or off every time the line is executed. You can use line 110 anywhere you want a star to blink when a line is executed. Also, if you change the 42 to the decimal equivalent of any other character, say 73, then you'll have blinking I's ... or is it eyes ?

```
100 FOR I = TO 100
110 IF PEEK(15360) = 32 THEN
    POKE 15360, 42 ELSE POKE
    15360, 32
120 PRINT #-1, A(I)
130 NEXT I
```

ables, inventory, etc. and roughly the same for 16K stand-alone.)

BIZ-80 is not going to be cheap, but will be well worth the investment. Canned software for business invariably leaves some adapting to the user, and you're sure to find the after-sale support most helpful. Useful subroutines will be prepared and published, and add-on services, such as custom programming and short term computer rentals will likewise be brought to your attention.

PROG-80, as the name suggests, will be dedicated to those of you who are most interested in the potential of microcomputers in general, and the TRS-80 in specific. Our main intent will be to share programming technique.

In preparing our Programming Hints for SoftSide, we soon began to notice that many "hints" that should be offered would require several pages to explain, not to mention the additional pulp that would be burned in offering notes for application and other uses. It is exactly this type of information that PROG-80 will present. The cost will be about $3.00 per issue, published at least quarterly, possibly bi-monthly. Initial subscriptions will be on a per issue basis, so that we can take the time to instill quality without the ugly spectre of a deadline breathing down our backs.

Programming Fare

Some of you may recall the rather heavy-handed request for programs we made back a couple of issues ago. Among the programs requested in the ad was 'Round the Horn, a simulation of a passage through the Straits of Magellan in a trading ship of the 1800's, and Chromatic Composer, a program that would allow you to compose music on your TRS-80 and play it back through any portable AM radio placed near the processor.

To make a long story short, as you can see by our cover, the good reverend George Blank was quick to answer the call with this month's feature article, and added more excitement to the Horn passage by turning the voyage into a race. You can either play by yourself and try to better the existing record (good

luck!) or play with up to two of your friends. The accompanying article should give some helpful insights on just what considerations should be given to writing a good computer game ... or any game for that matter. Part two of that same article, which will be published in our February issue, shows how the game concept is taken from rough idea to packaged program, and uses 'Round the Horn as an example. What about Chromatic Composer ? The Author is locked away in Florida, working out the finishing touches and it will soon be published in an upcoming issue in all its 5-octave beauty. Ten Pin Bowling and the accompanying article on making better use of TRS-80 graphic capabilities are sure to both entertain and inform.

All in all, we think this is the best SoftSide yet, and thanks to you, it can only get better from here. **CES**

REWARD

$100.00 cash reward for information leading to the successful interfacing of an 80 column card reader to my TRS-80 level 2/32K/2 disc system with a RS232 card in my expansion interface including a RS/MODEM.

I would like to use a "documentation" reader however I am willing to try any brand.

If claims by more than one person are made for this reward, the final determination as to which person or persons shall be eligible to receive part or all of this reward shall be determined by James R. Gillem. The maximum amount of reward shall be $100.00.

James R. Gillem
2855 Mitchell Dr. 235
Walnut Creek, CA 94598
Please call collect:
Days [415] 935-2500
Nites [415] 938-0307

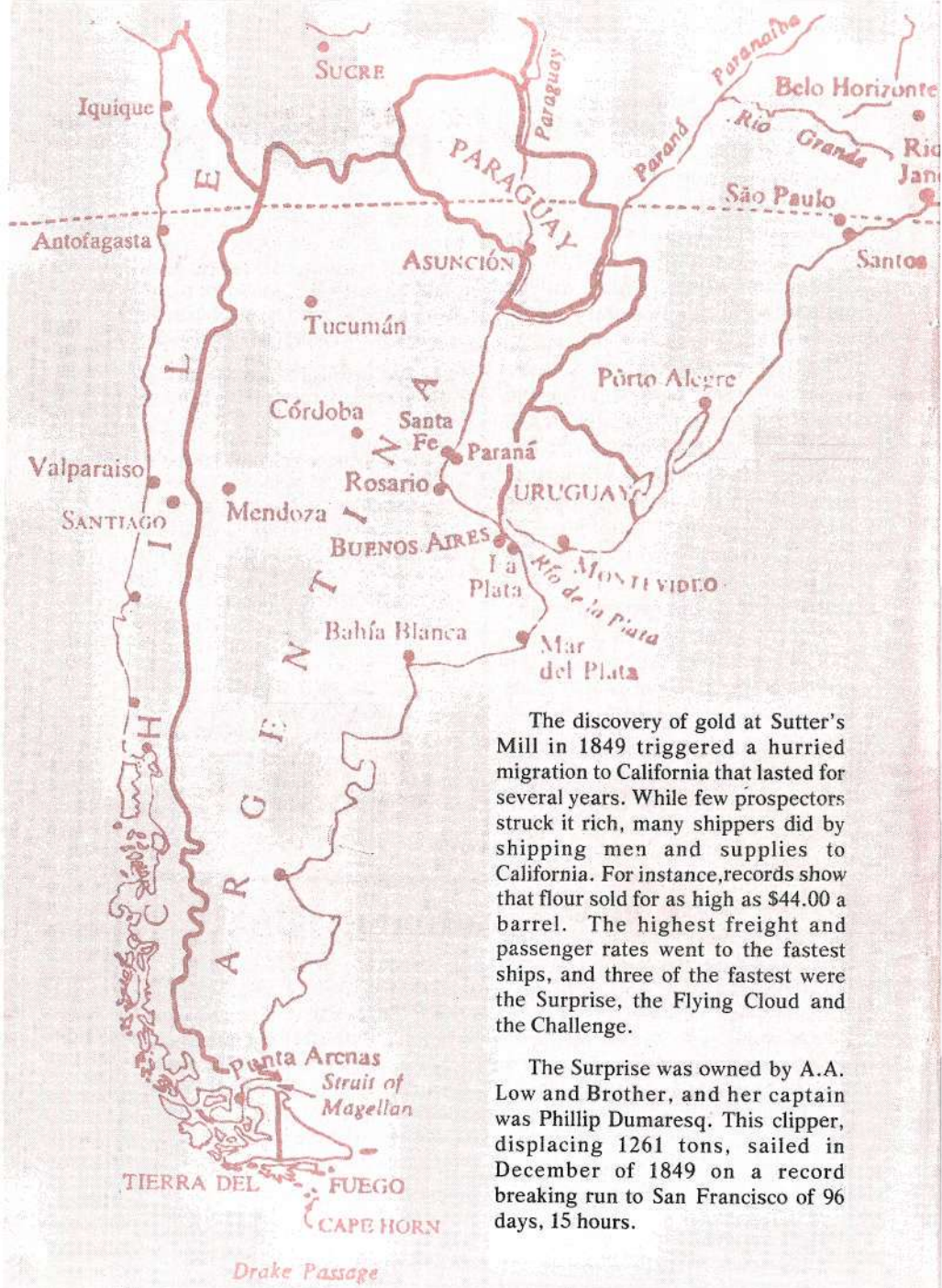
TRS-80 Programming Hint

According to the Radio Shack manual, THEN is optional in an IF ... THEN clause. In fact, there are occasions when the computer cannot distinguish between the test clause and the conditional operation, sometimes with all mathematical operations. This might be a nuisance, as it may not be apparent when the computer fails to take action, for it will simply pass to the next line without executing the conditional operation. The safest method is simply to use THEN all the time, if you have enough memory. Otherwise, you can test the clause to see if it executes properly. If it does not, you can still save two bytes by enclosing the test formula in parentheses. Therefore, if

100 IF C=0 C=1

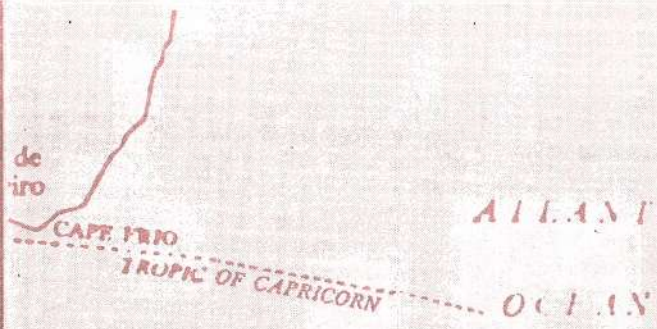
does not work, either of these will;

100 IF C=0 THEN C=1 or 100 IF (C=0) C=1



The discovery of gold at Sutter's Mill in 1849 triggered a hurried migration to California that lasted for several years. While few prospectors struck it rich, many shippers did by shipping men and supplies to California. For instance,records show that flour sold for as high as $44.00 a barrel. The highest freight and passenger rates went to the fastest ships, and three of the fastest were the Surprise, the Flying Cloud and the Challenge.

The Surprise was owned by A.A. Low and Brother, and her captain was Phillip Dumaresq. This clipper, displacing 1261 tons, sailed in December of 1849 on a record breaking run to San Francisco of 96 days, 15 hours.



'Round the Horn

by Rev. George Blank

The high demand for fast shipping, not only in the California trade but in the trans-Atlantic trade to Liverpool and the China tea and spice trade as well, led to the golden age of the clipper ship. Two of the greatest were launched within weeks of each other in 1851, and raced to California amidst great publicity. They were the Flying Cloud and the Challenge.

The Flying Cloud, owned by Grinnel, Minturn and Company, was captained by Josiah Cressy. This ship of 1782 tons left on June 2, 1851, and set a new record for the California trade of 89 days and 21 hours. This record stood for several years, partly due to stormy weather that moved the ship to record breaking speeds of over 300 miles a day several times. (The ship did suffer damage to her masts and rigging on the run.)

The Challenge sailed a few weeks later and ran into very calm weather, leading to a disappointing but still impressive time of 108 days. Captained by Bob "Bully" Waterman, the Challenge was the largest ship of her day at 2006 tons, and was owned by N.L. & G. Griswold.

This computer program tampers with history a little to allow the three ships to sail from New York on the same day on a race to San Francisco. You will captain one of the ships and attempt to find favorable winds and currents that will allow you to get to San Francisco first. It is by no means

certain you will arrive in San Francisco. The passage around Cape Horn is dangerous, and many vessels were wrecked there. If you try to sail through the doldrums at an angle and have bad luck, you could spend months right there.

The computer will display a map of North and South America, with New England indicated by the letter N and San Francisco by the letter S. Your position will be indicated by an exclamation mark, and that of the other vessels by the first letter of their name, assuming that they are not in the same square. To win, all you have to do is sail your ship into the square containing the S in the fewest days. As soon as you enter any point in that square, the computer will print an arrival notice.

You will begin each turn by indicating the course you wish to sail. While the computer asks for a number, it will also respond to "N", "E", "S", and "W" for North, East, South, and West.

Once you have entered a course, the computer will display your ship, the ocean, any land in sight from the bow, and your fore topmast staysail. The size and position of your sail will indicate the tack you are on. The wind comes across the side of your ship opposite the sail. The three sizes of sail indicate that you are close hauled, (sailing into the wind) on a reach, (wind coming from the side) or running, (wind at your back). The larger the sail, the faster you are going.

Ships cannot sail directly into the wind, and yours is no exception. In fact, it will not sail closer than forty-five degrees to the direction from which the wind is coming. The computer will automatically change your course if the wind shifts against you, and change it back when the wind changes back. Should you wish to make a course correction, you may press "Z" for a 22.5 degree turn to starboard (right for you landlubbers) or "/" for a turn to port. You will find it especially helpful to keep one finger on the Z and one on the / when you are making the passage around Cape Horn.

In the center of the screen, directly above the waves, the computer will display any land that is in sight. Don't count on seeing land before you run aground! Sometimes you will see it in time and sometimes not. It is safer (but sometimes slower) to stay away from the coast completely.

There are some navigational aids provided by the computer. You have a compass in the center of the ship, and a nameplate under it. When the computer accepts a course change, it will display "PORT" or "STARB'D" where the nameplate is. At the bottom left is information on the direction the wind is coming from and the windspeed. The bottom right displays the ship's calendar and your last navigational position. Expert players will want to depend on this latitude and longitude display extensively, for the map and land displays give only a rough indication. As a help to players, I have enclosed a table of ocean currents, a table of climatic regions, and some notices to mariners, all of which relate to the Latitude and Longitude.

'Round the Horn, continued

Landlubbers may assume that a ship will sail in the direction she is pointed, but "it ain't necessarily so". Two other factors affect your course: leeway and current. Leeway is the result of the wind blowing you off course in the direction it is blowing. Current carries you in the direction the water is flowing; most globes and atlases list ocean currents to give you an idea of the direction. The globe may be easier to understand than the table provided, as the simulation is reasonably accurate.

Weather is also a factor, but there is a trick to it: the computer only checks the region at the beginning of each turn. So, you can wait just North or South of the Doldrums for a good wind, and possibly get completely across without getting stuck. If you think this is cheating, enter this line in your program:

1110 GOSUB 7000:GOSUB 7600

The region will then be checked on each half-day, but the game may take longer.

Just in case some sharpie tries to compare my latitude and longitude with the atlas — they don't make very accurate atlases these days ! Besides, haven't you ever heard of the continental drift theory ?

BON VOYAGE !

NOTICES TO MARINERS

1) Observe special caution in Long Island Sound, Eastern U.S. coast at 40 degrees North Latitude. Onshore current is treacherous, especially when combined with Southerly winds.

2) The Cape Horn Passage is extremely dangerous. For safe passage, remain South of 55 degrees, 30 minutes until Longitude 72 degrees West and South of 46 degrees Latitude until Longitude 84 degrees West. Dangerous polar ice is virtually certain South of 64 degrees South Latitude.

3) The Caribbean Sea contains many unmarked reefs and is especially hazardous without local knowledge.

4) Vessels are advised to maintain good distance from the Northeast Coast of South America. Light winds and flat calms, combined with unfavorable currents, make long delays likely.

5) Vessels bound for California are advised to set course well West of the Southern coast of Mexico. Light winds make delays likely.

6) Beware of all Capes. Reefs often project out from them and make sudden shipwreck likely. (Computer only checks for land due North, East, South, and West. If you approach a Cape from the Northeast, for example, you will run aground before any land is displayed.)

OCEAN CURRENTS

Name	North - South		West - East	
Japan Current	48N	-32N	132W	--
Japan Current	32N	-19.2N	129W	-114W
Gulf Stream	48N	-32N	--	39W
Gulf Stream	32N	-19.2N	--	63W
Canaries Current	48N	-28N	39W	--
N. Equatorial Current	19.2N	-8N	--	--
Guinea Current	8N	-0	24W	--
S. Equatorial Current	0	-9.2S	--	--
Humbolt Current	9.2S	-27.6S	102W	--
Brazil Current	9.2S	-27.6S	--	48W
Benguela Current	9.2S	-27.6S	9W	--
West Wind Drift	44.2S	-64.4S	--	--

Name	Direction	Speed [Knots]
Japan Current	South	1
Japan Current	South	.7
Gulf Stream	ENE	1.9
Gulf Stream	North	1
Canaries Current	SSW	1
N. Equatorial Current	West	1.2
Guinea Current	East	1.3
S. Equatorial Current	West	2.1
Humbolt Current	North	1.8
Brazil Current	South	1.5
Benguela Current	North	2
West Wind Drift	West	2.2

CLIMATIC REGIONS

Name	Southern Limit	Typical Winds
Horse Latitudes	32N	Strong & variable
Northeast Trades	8N	Moderate from Northeast
Doldrums	3S	Calm & variables
Southeast Trades	28S	Moderate from Southeast
Roaring Forties	64S	Strong & Westerly

```
10 REM * AROUND THE HORN *
20 REM * COPYRIGHT 1978 GEORGE BLANK LEECHBURG PA 15656 *
30 GOSUB 3000
99 'INITIALIZE
100 CLEAR 600
110 DIM D(3):DIM E(3,4):DIM H(15):DIM L(16,3):DIM N(3,12):DIM S(3,2):DIM
    T(3,2):DIM V(15):DIM W(5,4)
120 DIM D$(15)
130 FOR A=0TO15:READ D$(A):READ H(A):READ V(A):NEXT
140 FOR A=1TO3:READ C$(A):NEXT
160 W$(0)="..:::.....:::::.....:::::.....:::::::::.....:::::."
170 W$(1)=LEFT$(W$(0),16):W$(2)=MID$(W$(0),3,16):W$(3)=MID$(W$(0),6,16)
   :W$(4)=MID$(W$(0),9,16):W$(5)=RIGHT$(W$(0),16)
190 FOR A=1TO3:N(A,1)=35:N(A,2)=1.1:N(A,3)=99:N(A,4)=1:N(A,5)=1:NEXT
200 FOR A=1TO5:W(A,1)=29+RND(100)/100:NEXT
210 W(1,1)=W(1,1)+1:W(3,1)=W(3,1)-1
220 FOR A=1TO3:N(A,8)=W(1,1):NEXT
300 CLS:PRINT
310 PRINT"CLIPPER - A RACE AROUND THE HORN TO CALIFORNIA IN 1852"
320 PRINT:PRINT"HOW MANY PLAYERS (1 TO 3) ?"
330 A$=INKEY$:IF A$="" THEN 330 ELSE P=VAL(A$)
340 IF P<1 THEN P=1
350 IF P>3 THEN P=3
360 IF P<3 THEN N(3,0)=-10
370 IF P=1 THEN N(2,0)=-10
380 PRINT P;"PLAYER";:IF P>1 THEN PRINT"S";
390 PRINT
999 'CONTROL ROUTINE
1000 IF N(1,0)=-10 AND N(2,0)=-10 AND N(3,0)=-10 THEN 2300
1010 GOSUB 7500
1020 FOR C=1TOP
1025  IF N(C,0)=-10 THEN 1170
1030  GOSUB 7000:GOSUB 7600:GOSUB 7700
1040  GOSUB 9000
1050  GOSUB 8000
1060  FOR CL=1TO14
1062   IF WR=1 THEN 1150
1065   GOSUB 8200
1070   GOSUB 8040
1075   GOSUB 8200
1080   GOSUB 2060
```

```
1085   IF INT(CL/2)=CL/2 THEN D(C)=D(C)+1
1090   GOSUB 8300
1100   GOSUB 8200
1120   GOSUB 7700
1130   GOSUB 8200
1140   GOSUB 8400
1150   NEXT CL
1160 WR=0
1170 NEXT C
1190 GOTO 1000
1999 'NEW LOCATION
2000 R=N(C,4):T=0:N(C,0)=N(C,12)
2009 'PORT TACK
2010 IF N(C,0)>N(C,11) THEN T=N(C,0)-N(C,11):T(C,2)=2:IF T=1 THEN
     T=2:N(C,0)=N(C,0)+1
2019 'STARBOARD TACK
2020 IF N(C,0)<N(C,11) THEN T=N(C,11)-N(C,0):T(C,2)=1:IF T=1 THEN
     T=2:N(C,0)=N(C,0)-1
2025 IF N(C,0)>15 THEN N(C,0)=0
2030 IF T=0 THEN N(C,0)=N(C,0)-1:GOTO 2020
2035 IF N(C,0)<0 THEN N(C,0)=16+N(C,0)
2040 IF T>8 THEN T=16-T
2050 IF T>1 THEN M=.6:T(C,1)=1:IF T>3 THEN M=1:T(C,1)=2:IF T>5
     THEN M=1.2:T(C,1)=3
2052 IF T(C,1)<>S(C,1) OR T(C,2)<>S(C,2) THEN GOSUB 2500
2055 M=M*N(C,5)*N(C,10)/8:GOTO 8050
2060 D=N(C,0):H=N(C,1):V=N(C,2):L=W(R,4)+8:IF L>15 THEN L=L-16
2070 H=H+(H(D)*M)/6+H(L)/600*N(C,10)+N(C,6)/30
2080 V=V+(V(D)*M)/10+V(L)/1000*N(C,10)+N(C,7)/50
2085 GOSUB 2400
2090 N(C,1)=H:N(C,2)=V:N(C,3)=INT(V)*64+INT(H)
2100 IF N(C,3)=145 THEN 2600
2190 RETURN
2200 CLS
2210 PRINT
2220 PRINT"SOS ...---... SOS ...---... SOS"
2230 PRINT
2240 PRINT" S H I P W R E C K !"
2250 PRINT
2260 PRINT"THE CLIPPER ";C$(C);" WAS LOST AT SEA WITH ALL HANDS"
```

```
2265 GOSUB 2700
2270 N(C,0)=-10:E(C,1)=2:E(C,2)=H:E(C,3)=V:E(C,4)=D(C):N(C,3)=99
2275 PRINT"LAST REPORTED POSITION ";:PRINT USING F$;LA;:PRINT USING G$;LO
2280 FOR A=1TO2000:NEXT A
2290 WR=1:RETURN
2299 'END OF GAME
2300 CLS:PRINT:PRINT" G A M E   O V E R":PRINT
2310 FOR C=1TOP
2320  IF E(C,1)=2 THEN 2350
2330  PRINT"THE CLIPPER ";C$(C);" SAILED TO SAN FRANCISCO IN";E(C,4);"DAYS"
2340  PRINT:GOTO 2370
2350  PRINT"THE ";C$(C);" WAS LOST AT SEA AFTER";E(C,4);" DAYS"
2360  H=E(C,2):V=E(C,3):GOSUB 2700:PRINT"NEAR ";:PRINT USING F$;LA;
      :PRINT USING G$;LO
2365 PRINT
2370 NEXT C
2380 INPUT"(PRESS ENTER FOR NEW GAME)";A$
2390 RUN
2400 B$="### DAYS ":PRINT@ 951,"";
2410 PRINT USING B$;D(C);
2420 GOSUB 2700
2430 PRINT@ 1005,"";
2440 PRINT USING F$;LA;
2450 PRINT USING G$;LO;
2490 RETURN
2500 IF S(C,2)=T(C,2) THEN 2540
2510 IF S(C,2)=2 THEN X=6*S(C,1)+1:FOR B=15392TO15904 STEP 64:FOR A=B+1 TO
     B+X:POKE A,128:NEXT A:X=X+1:NEXT B
2520 IF S(C,2)=1 THEN X=6*S(C,1)+1:FOR B=15392TO15904 STEP 64:FOR A=B-X TO
     B-1:POKE A,128:NEXT A:X=X+1:NEXT B
2530 GOTO 8050
2540 IF T(C,1)>S(C,1) THEN 2530
2550 IF T(C,2)=2 THEN X=6*S(C,1)+9:Y=6*T(C,1):FOR B=15392TO15904
     STEP 64:FOR A=B+Y TO B+X:POKE A,128:NEXT A:Y=Y+1:NEXT B
2560 IF T(C,2)=1 THEN X=6*S(C,1)+9:Y=6*T(C,1):FOR B=15392TO15904
     STEP 64:FOR A=B-X TO B-Y:POKE A,128:NEXT A:Y=Y+1:NEXT B
2570 GOTO 8050
2600 CLS:PRINT
2610 PRINT"THE CLIPPER ";C$(C);" HAS JUST ARRIVED IN SAN FRANCISCO"
2620 PRINT"AND IS UNLOADING CHOICE EASTERN MERCHANDISE AT THE WHARF.":PRINT
2630 PRINT"  THIS FAST SHIP,";D(C);" DAYS OUT OF NEW YORK, IS NOW"
```

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

TSE TRS-80 Software Exchange
17 Briar Cliff Drive Milford, New Hampshire 03055

STAR TREK III

STARDATE: 2200

From Admiral Fitzpatrick —

You are to enter and explore the Omega VI region of the galaxy, gather information on other inhabitable planetary systems you may encounter and defend yourself against hostiles in case of attack. You are in command of the Starship ENTERPRISE and her ship's complement of 371 officers and crew. Omega VI is composed of 192 quadrants containing star systems and planets (a few habitable). Information on Omega VI is sketchy, but astronomical hazards such as pulsars, Class 0 stars and black holes are known to be present in the region. It is also patrolled by Klingon battle cruisers, so look before you leap.

Specs: Star Trek III

by Lance Micklus

Play Board: 8 by 8 by 3 quadrants
Weapon Systems: Phaser and Photon Torpedoes
Power Systems: Warp and Impulse
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```
2635 PRINT"BOOKING PASSENGERS AND FREIGHT FOR NEW YORK."
2640 E(C,1)=1:E(C,4)=D(C):N(C,0)=-10
2650 PRINT:PRINT"TOUCH ANY KEY TO CONTINUE"
2660 A$=INKEY$:IF A$="" THEN 2660
2690 GOTO1000
2700 IF V>6 THEN 2740
2710 F$=" ##.## N "
2720 LA=(6-V)*8.2
2730 GOTO 2760
2740 F$=" ##.## S "
2750 LA=(V-6)*9.2
2760 G$=" ###.## W"
2770 LO=174-H*3
2790 RETURN
2999 ' INSTRUCTIONS
3000 CLS:PRINT
3010 PRINT"   THIS GAME SIMULATES A CLIPPER SHIP RACE AROUND THE HORN"
3020 PRINT"DURING THE CALIFORNIA GOLD RUSH.  THE FIRST PERSON TO GO"
3030 PRINT"FROM NEW YORK (N) TO SAN FRANCISCO (S) WINS."
3040 PRINT:PRINT"    TO SAIL YOUR SHIP, AT THE BEGINNING OF A TURN, ENTER"
3050 PRINT"YOUR INTENDED COURSE AS DIRECTED.  IF YOU WANT TO CHANGE"
3100 PRINT"COURSE DURING A TURN, PRESS /   (OR S) FOR A TURN TO"
3110 PRINT"STARBOARD (RIGHT) OR PRESS Z  (OR P) TO TURN TO
     PORT (LEFT)."
3230 PRINT"  ANTARCTIC ICE BEGINS AT 64.4 DEGREES SOUTH.  CAPE HORN"
3240 PRINT"EXTENDS FROM 69 DEGREES WEST TO 74 DEGREES WEST AT 55.5"
3250 PRINT"DEGREES SOUTH.  IF YOU TOUCH ANY OF THESE BOUNDARIES OR ANY"
3260 PRINT"OTHER LAND MASS, YOU WILL SHIPWRECK.":PRINT:INPUT"
     (PRESS ENTER)";A$
3270 CLS:PRINT:PRINT"   THE DOLDRUMS EXTEND FROM 8.2 DEGREES
     NORTH TO 2.8 DEGREES"
3280 PRINT"SOUTH.  IF YOU FINISH A TURN IN THE DOLDRUMS, IT MAY TAKE"
3290 PRINT"MONTHS TO GET OUT BECAUSE OF LIGHT WINDS."
3300 PRINT:PRINT"   THE COMPUTER CONSIDERS ANY POSITION BETWEEN 120 AND 123"
3310 PRINT"DEGREES WEST AND 24.6 TO 32.8 DEGREES NORTH TO BE A SAFE"
3320 PRINT"ARRIVAL IN SAN FRANCISCO.  YOUR POSITION IS AFFECTED BY"
3330 PRINT"WIND, CURRENT, LEEWAY, AND YOUR SAIL POSITION."
3520 PRINT"SEE AN ATLAS, GLOBE, OR NAVIGATION CHARTS FOR APPROXIMATE"
3530 PRINT"DESCRIPTION OF WEATHER CONDITIONS AND CURRENT."
3540 PRINT:INPUT" (PRESS ENTER TO BEGIN)";A$
3550 RETURN
```

```
3999 'COMMANDS
4000 C$=INKEY$
4010 IF C$="Z" THEN C$="P"
4020 IF C$="P" THEN N(C,12)=N(C,12)-1
4030 IF N(C,12)<0 THEN N(C,12)=15
4035 IF C$="/" THEN C$="S"
4040 IF C$="S" THEN N(C,12)=N(C,12)+1
4050 IF N(C,12)>15 THEN N(C,12)=0
4060 IF C$="P" THEN PRINT@ 985,"    PORT    ";
4070 IF C$="S" THEN PRINT@ 985," STARBOARD  ";
4090 RETURN
4999 'SHORELINE
5000 D=N(C,0)
5010 ON D+1 GOSUB 5100,5110,5120,5130,5140,5150,5160,5170,5180,5190,
     5200,5210,5220,5230,5240,5250
5020 PRINT@ 576,A$;
5090 RETURN
5100 A=DW:U=2:GOSUB 5700:A=DW:U=32:GOSUB 5700:A=DE:U=61:GOSUB 5700:RETURN
5110 A=DW:U=16:GOSUB 5700:A=DE:U=58:GOSUB 5700:RETURN
5120 A=DW:U=10:GOSUB 5700:A=DE:U=54:GOSUB 5700:RETURN
5130 A=DW:U=6:GOSUB 5700:A=DE:U=48:GOSUB 5700:RETURN
5140 A=DW:U=2:GOSUB 5700:A=DE:U=32:GOSUB 5700:A=DS:U=61:GOSUB 5700:RETURN
5150 A=DE:U=16:GOSUB 5700:A=DS:U=58:GOSUB 5700:RETURN
5160 A=DE:U=10:GOSUB 5700:A=DS:U=54:GOSUB 5700:RETURN
5170 A=DE:U=6:GOSUB 5700:A=DS:U=48:GOSUB 5700:RETURN
5180 A=DE:U=2:GOSUB 5700:A=DS:U=32:GOSUB 5700:A=DW:U=61:GOSUB 5700:RETURN
5190 A=DS:U=16:GOSUB 5700:A=DW:U=58:GOSUB 5700:RETURN
5200 A=DS:U=10:GOSUB 5700:A=DW:U=54:GOSUB 5700:RETURN
5210 A=DS:U=6:GOSUB 5700:A=DW:U=48:GOSUB 5700:RETURN
5220 A=DS:U=2:GOSUB 5700:A=DW:U=32:GOSUB 5700:A=DN:U=61:GOSUB 5700:RETURN
5230 A=DW:U=16:GOSUB 5700:A=DN:U=58:GOSUB 5700:RETURN
5240 A=DW:U=10:GOSUB 5700:A=DN:U=54:GOSUB 5700:RETURN
5250 A=DW:U=6:GOSUB 5700:A=DN:U=48:GOSUB 5700:RETURN
5700 Q=A*A
5710 IF Q>3 THEN 5790
5720 B=SQR(4-Q)
5730 X=RTN(B/A)
5740 IF X>2 THEN X=2
5750 X=INT(X*32)
5780 GOSUB 5800
5790 RETURN
```

```
5800 Y=U-X:Z=U+X
5805 IF A<1 THEN AA=10-10*A:Y=Y-AA:Z=Z+AA
5810 IF Y>64 AND Z>64 THEN 5890
5820 IF Y<1 AND Z<1 THEN 5890
5830 IF Y<1 THEN Y=1
5840 IF Z>64 THEN Z=64
5850 IF U<32 AND Z>U+8 THEN Z=U+8
5860 IF U>32 AND Y<U-8 THEN Y=U-8
5870 L$="[":IF V>3 THEN L$="&":IF V>7 AND H<32 THEN L$="#"
5875 IF V>10 AND A=05 THEN L$="-"
5880 GOSUB 5900
5890 RETURN
5900 A=Z-Y:B$="":FOR B=1TOA:B$=B$+L$:NEXT:AL$="":AR$=""
5910 AL$=LEFT$(A$,Y-1)
5920 AR$=RIGHT$(A$,64-Z)
5930 A$=AL$+B$+AR$
5990 RETURN
6999 'DETERMINE REGION AND OCEAN CURRENTS
7000 H=N(C,1):V=N(C,2):N(C,6)=0:N(C,7)=0:IF V>2.5 THEN 7100
7010 N(C,4)=1
7020 IF V<2 AND H>30 AND H<45 THEN N(C,6)=1.9:N(C,7)=-.2
7030 IF H>45 THEN N(C,6)=-.4:N(C,7)=.8
7040 IF H>14 AND H<18 THEN N(C,7)=1
7090 GOTO 7490
7100 IF V>5 THEN 7200
7110 N(C,4)=2
7120 IF V>3.6 THEN N(C,6)=-1.2:GOTO 7190
7130 IF H>15 AND H<20 THEN N(C,7)=.7
7140 IF H>32 AND H<37 THEN N(C,7)=-1
7190 GOTO 7490
7200 IF V>6.3 THEN 7300
7210 N(C,4)=3
7220 IF H>45 THEN N(C,6)=1.3
7290 GOTO 7490
7300 IF V>9 THEN 7400
7310 N(C,4)=4
7320 IF V<7 THEN N(C,6)=-2.1:GOTO 7390
7330 IF H<42 AND H>32 THEN N(C,7)=1.5
7340 IF H>48 THEN N(C,7)=-2
7350 IF H>24 AND H<31 THEN N(C,7)=-1.8
7390 GOTO 7490
```

```
7400 N(C,4)=5
7410 IF V>10.8 THEN N(C,6)=2.2:GOTO 7490
7420 IF H>27 AND H<37 THEN N(C,7)=-1.8
7430 IF H>37 AND H<41 THEN N(C,7)=1.4
7490 RETURN
7499 'WEATHER BY REGION
7500 W(1,2)=RND(6)-1:IF W(1,1)>30 THEN W(1,2)=-W(1,2)
7510 A=ABS(W(1,2)):W(1,3)=RND(7)*RND(A+1)+RND(15)-1:W(1,4)=RND(16)-1
7520 W(2,2)=RND(6)-1:IF W(2,1)>29.5 THEN W(2,2)=-W(2,2)
7530 A=ABS(W(2,2)):W(2,3)=RND(5)*RND(A+1):IF W(2,3)<10
     THEN W(2,3)=W(2,3)+RND(15)
7535 W(2,4)=2+RND(8)-RND(8):IF W(2,4)<0 THEN W(2,4)=W(2,4)+16
7540 W(3,2)=RND(3)-1:IF W(3,1)>29 THEN W(3,2)=NW(3,2)
7550 A=ABS(W(3,2)):W(3,3)=RND(3)*A+RND(3)-1:W(3,4)=RND(16)-1
7560 W(4,2)=RND(6)-1:IF W(4,1)>30 THEN W(4,2)=-W(4,2)
7570 A=ABS(W(4,2)):W(4,3)=RND(6)*A:W(4,4)=6+RND(8)-RND(8):IF
     W(4,4)<0 THEN W(4,4)=15
7575 IF W(4,3)<10 THEN W(4,3)=W(4,3)+RND(21)-1
7580 W(5,2)=RND(3)+2:IF W(5,1)>29.7 THEN W(5,2)=-W(5,2)
7590 A=ABS(W(5,2)):W(5,3)=(3+RND(7))*A:W(5,4)=11+RND(8)-RND(8):IF
     W(5,4)>15 THEN W(5,4)=W(5,4)-16
7595 FOR A=1TO5:W(A,1)=W(A,1)+W(A,2)/7:NEXT:RETURN
7599 'CURRENT PLAYER'S WEATHER
7600 R=N(C,4):N(C,8)=W(R,1)
7610 N(C,9)=W(R,2)/50
7620 N(C,10)=W(R,3)
7630 N(C,11)=W(R,4)
7690 RETURN
7699 'HOURLY CHANGE IN WEATHER
7700 N(C,8)=N(C,8)+N(C,9)
7710 N(C,10)=N(C,10)+RND(3)-2:IF N(C,10)<0 THEN N(C,10)=0
7720 IF N(C,8)<28 AND N(C,9)<-.09 THEN N(C,10)=N(C,1)+RND(5):A=RND(12):IF
     (A+CL)>10 THEN N(C,9)=-N(C,9)
7730 N(C,11)=N(C,11)+RND(3)-2
7740 IF N(C,11)>15 THEN N(C,11)=0
7750 IF N(C,11)<0 THEN N(C,11)=15
7790 RETURN
7999 'VIEW FROM BOW
8000 CLS
8010 FOR A=16128TO16382:POKE A,191:NEXT
8020 FOR A=16139TO16146:POKE A,128:POKE A+32,128:NEXT
```

```
8030 POKE 16895,190:POKE 16896,189
8040 GOTO 2000
8050 IF T(C,2)=1 GOSUB 8100
8060 IF T(C,2)=2 GOSUB 8150
8070 S(C,1)=T(C,1)
8080 S(C,2)=T(C,2)
8090 RETURN
8099 'SAIL FOR STARBOARD TACK
8100 X=6*T(C,1):FOR B=15392TO15904 STEP 64:FOR A=B-X TO B:POKE A,191:NEXT
     A:X=X+1:POKE B-X,186
8110 NEXT B:RETURN
8149 'SAIL FOR PORT TACK
8150 X=6*T(C,1):FOR B=15392TO15904 STEP 64:FOR A=B TO B+X:POKE A,191:NEXT
     A:X=X+1:POKE B+X,181
8160 NEXT B:RETURN
8199 'WAVES
8200 W=W+1:IF W=4 THEN W=1
8210 PRINT@ 640,W$(W);W$(W);W$(W);W$(W);
8220 W$(0)=LEFT$(W$(W+1),15)
8230 PRINT@ 704,W$(W+1);W$(0);:PRINT@ 737,W$(0);W$(W+1);
8240 W$(0)=LEFT$(W$(W+2),8)
8250 PRINT@ 779,W$(0);:PRINT@ 811,W$(0);
8260 GOSUB 4000
8290 RETURN
8299 'DATA DISPLAY
8300 D=N(C,0):PRINT@ 862,D$(D);
8310 PRINT@ 985,C$(C);
8320 PRINT@ 896,"WIND ";
8330 PRINT@ 960,D$(N(C,11));
8340 B$="### KNOTS "
8350 PRINT USING B$;N(C,10);
8390 RETURN
8399 'LAND TEST - C(0)=LAND NEARBY  1=N 2=E 3=S 4=W
8400 H=N(C,1):V=N(C,2):X=INT(H):Y=INT(V)
8410 DW=H:DN=V:DE=64-H:DS=13-V
8419 'NORTH BOUNDARY
8420 IF H<16 OR H>44 THEN 8550
8430 IF H<44 THEN DN=V-8
8435 IF H<42 THEN DN=V-9
8440 IF H<38 THEN DN=V-10
8450 IF H<35 THEN DN=V-12
```

```
8460 IF H<33.5 THEN DN=V-11
8465 IF X>30 AND X<34 THEN DN=V-11
8470 IF H<31 THEN DN=V-8
8475 IF H<29 THEN DN=V-6
8480 IF H<27 THEN DN=V-5
8485 IF H<20 THEN DN=V-(X-15)
8490 IF H<34 OR V>8 THEN 8550
8499 'EASTERN ATLANTIC
8500 IF X<44 THEN DN=V:DS=6-V
8505 IF X=39 THEN DN=V
8510 IF X<39 THEN DN=V-1
8520 IF X<35 THEN DN=V-2
8530 IF X>41 AND X<45 THEN DS=7-V
8549 'WEST COAST
8550 IF H>32 THEN 8600
8555 IF V=12 THEN 8690
8560 IF V<5 THEN DE=(15+V)-H:GOTO 8690
8570 IF V=11 THEN DE=33.5-H
8575 IF V<11 THEN DE=31-H
8580 IF V<8 THEN DE=29-H
8585 IF V=5 THEN DE=27-H
8590 GOTO 8690
8599 'EAST COAST
8600 IF V<12 THEN DW=H-36
8610 IF V=9 THEN DW=H-38
8620 IF V=8 THEN DW=H-42
8630 IF V=7 THEN DW=H-44
8640 IF V=6 THEN DW=H-43
8650 IF V=5 THEN DW=H-36
8660 IF V<5 AND V>1 THEN DW=H-33.5
8665 IF V=1 THEN DW=H-35
8670 IF V=0 THEN DW=H-39
8680 GOSUB 8200
8690 FOR A=0TO4:C(A)=0:NEXT
8700 IF DN<2 THEN C(1)=1:C(0)=1
8710 IF DE<2 THEN C(2)=1:C(0)=1
8720 IF DS<2 THEN C(3)=1:C(0)=1
8730 IF DW<2 THEN C(4)=1:C(0)=1
8740 A$="":FOR A=1TO64:A$=A$+" ":NEXT:IF C(0)=0 THEN 8790
8750 GOSUB 8200:GOSUB 5000
8760 IF DN<0 OR DE<0 OR DS<0 OR DW<0 THEN 2200
```

```
8790 RETURN
8999 'MAP
9000 CLS:A=15360
9010 POKE A+16,162:FOR B=A+17TOA+33:POKE B,191:NEXT:POKE A+34,151:FOR
     B=A+35TOA+37:POKE B,143:NEXT:POKE A+38,142
9020 A=A+64:POKE A+17,139:FOR B=A+18TOA+32:POKE B,191:NEXT:POKEA+33,159:POKE
     A+34,159
9030 A=A+64:POKE A+18,162:FOR B=A+19TOA+32:POKE B,191:NEXT:POKE A+33,157
9040 A=A+64:POKE A+19,131:FOR B=A+20TOA+25:POKE B,191:POKE B+6,143:NEXT:POKE
     A+20,175:POKE A+21,175:POKE A+28,135:POKE A+32,175:POKE A+33,145
9050 A=A+64:POKE A+21,133:POKE A+22,143:POKE A+23,143:FOR B=A+24TO A+26:POKE
     B,191:NEXT:POKE A+33,130
9060 A=A+64:POKE A+26,139:POKE A+27,173:FOR B=A+29TOA+38:POKE B,176:NEXT
9070 A=A+64:FOR B=A+28TOA+41:POKE B,191:NEXT:POKE A+42,180:POKE A+43,144
9080 A=A+64:POKE A+28,138:FOR B=A+29TOA+43:POKE B,191:NEXT
9090 A=A+64:FOR B=A+31TOA+36:POKE B,191:POKE B+64,191:POKE B+128,191:POKE
     B+5,191:NEXT:POKE A+41,143:POKE A+42,135
9100 A=A+64:POKE A+37,131
9110 A=A+64:POKE A+36,128
9120 A=A+64:POKE A+31,131:POKE A+32,191:POKE A+33,191:POKE A+34,181:POKE
     A+35,148
9130 PRINT@ N(1,3),"C";:PRINT@ N(2,3),"F";:PRINT@ N(3,3),"S";:PRINT@ 99,
     "N";:PRINT@ 145,"S";
9140 PRINT@ N(C,3),"!";
9150 PRINT@ 832, "CLIPPER ";C$(C);"     ";
9170 PRINT"WINDS ";D$(N(C,11));" AT";N(C,10);" KNOTS"
9230 PRINT@ 896,"1-N  2-NE  3-E  4-SE  5-S  6-SW  7-W  8-NW"
9240 PRINT@ 960,"CAPTAIN, WHAT HEADING DO YOU WISH (0-8)";
9250 A$=INKEY$:IF A$="" THEN 9250
9252 IF A$="N" THEN A$="1"
9253 IF A$="E" THEN A$="3"
9254 IF A$="S" THEN A$="5"
9255 IF A$="W" THEN A$="7"
9260 A=VAL(A$):IF (A<1)OR(A>8) THEN 9250
9270 N(C,12)=(A-1)*2
9490 RETURN
9999 GOTO 9999
10000 DATA " N ",0,-1,"NNE",.4,-.9," NE",.7,-.7,"ENE",.9,-.4
10010 DATA " E ",1,0,"ESE",.9,.4," SE",.7,.7,"SSE",.4,.9
10020 DATA " S ",0,1,"SSW",-.4,.9,"SW ",-.7,.7,"WSW",-.9,.4
10030 DATA " W ",-1,0,"WNW",-.9,-.4,"NW ",-.5,-.7,"NNW",-.4,-.9
10040 DATA " CHALLENGE  ","FLYING CLOUD","  SURPRISE  "
```

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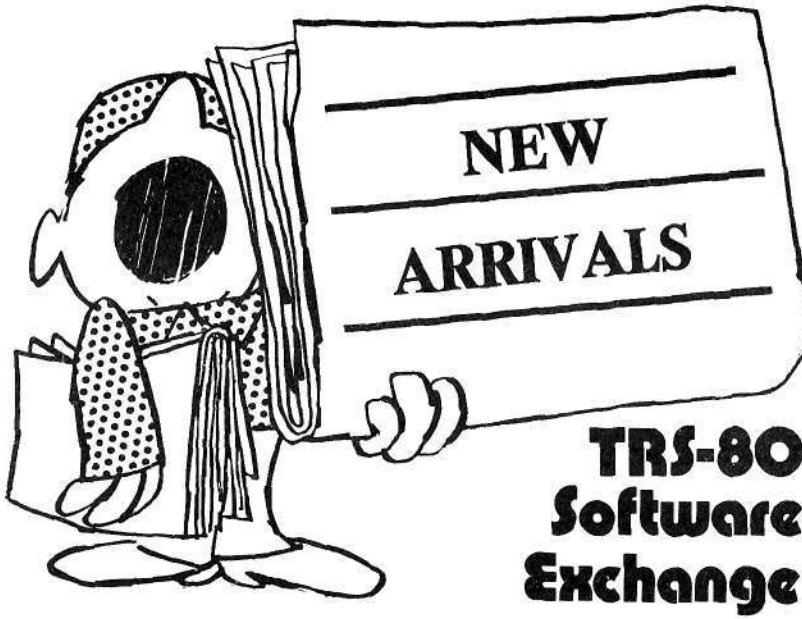

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Writing Good Computer Games

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

PART ONE: Philosophy

The Radio Shack TRS-80, and to a lesser extent, the Apple II and the Commodore Pet, have opened up a mass market for good computer programs. One of the most exciting factors in this new mass market is the incredible variety of the demand. Programs for business, education, household management, finance, mathematics, and games are just a few of the rapidly opening fields. Significant rewards await those programmers who can meet the demands of this emerging market.

Few good computer games have been written so far. Of the good ones, some are computer adaptations of games like Chess and Othello which existed first in another form. These games are good if they add a dimension to the play of the game that is not present in its original form, (such as the possibility of solo play), and do so in an aesthetically pleasing form . My personal opinion is that such computer adaptations will play a trivial role in the future of computer games and the best ones will be those which take unique advantage of the computer capabilities.

What are the computer's unique capabilities when used for gaming ? For one thing, the computer can use complex equations to develop new game situations almost instantaneously, making a complex game simpler for players. The computer can also either accurately simulate many real situations, or give plausible simulations of imaginary or fantasy situations. The computer can evaluate progress and keep score, portray many different situations in constantly changing graphic displays and even produce sound effects. I suspect that there are many more capabilities which are yet to be discovered. The truth is, computer gaming is developing so fast as a result of the thousands of new programmers writing games that today's best games may well become obsolete in six months.

Certain trends are already apparent in the marketplace. Visual excitement and real time action are much in demand. A year ago, successful computer games could print words on a screen and simply provide information or ask questions. Today, a good graphic display

is essential. The transition to graphics has only begun, and yet it is already possible to see a demand for animation. A year ago, most computer games performed one operation, then stopped to wait for another input. The current situation demands games which require real time involvement, where doing nothing still causes the game to advance. The limitations of the most popular computer, the Radio Shack TRS-80, have temporarily stalled the market, but future games will requre analog input such as joy sticks, sound and color. The Apple II, which has all of these features now, is the state of the art, but it too, will soon be outmoded as new demands arise.

While all of these trends are evident, there is still a prime opportunity for people who would like to get involved in writing computer games. Because of the immaturity of the marketplace there is currently a large demand for games, even though they will probably become obsolete in a few months. Right now it is possible for someone with imagination to develop the skills that will be required in future games — and get paid for it. Those programmers who start a year from now will find it much more difficult to break into the market. In the rest of this article, I will seek to outline the current market's demands.

The most important criteria for a good game are philosophical, and it doesn't matter whether it's a computer game, a board game, a ball game, or any other type of game. The single most important quality is a concept which in recent studies has been called "flow". Flow is the quality of absorption which draws you into the game and out of everyday life. Perhaps the best indicator of flow is the loss of a sense of time. Flow is that quality which causes you to exclaim, "My gosh, it's six o'clock already!". It is often experienced by computer hobbyists who are deeply involved in a computer program and then suddenly realize it's three AM and they haven't even eaten dinner. My personal opinion is that no computer game will ever be an adequate substitute for a good friend and a good bottle of wine, but then, given most people's tendency towards excessiveness, we do need some alternative to the wine to avoid alcoholism.

There are four qualities in games which can provide flow. They are: challenge, creativity, imagination, and social interaction. Often, only one of the four is needed for the success of a game. Sometimes the different qualities can work against each other, so that one of the four may prove better than all four within a particular game. Let's discuss each of them in turn.

Challenge in games usually takes one of three forms: competition, manual dexterity or intellect. Competition is the matching of wits between two or more players in such a manner that the outcome implies the superiority of one over the other. The popular myth that computers are intelligent makes the matching of wits against a machine an important element in competition. David Levy's boast ten years ago that no computer would beat him at chess before 1978 appeals to the competitive instinct in all of us. But really, computers are such high speed morons and humans such low speed geniuses that the best competition is between people, perhaps mediated

by a computer. A computer makes an excellent scorekeeper, especially if scorekeeping is complex.

When it comes to challenge in the form of manual dexterity, one of the best examples is the game of mumblety-peg. Was there ever a boy who didn't spend hours throwing a knife into the ground ? The ultimate game of manual dexterity is probably an aerial dogfight between two fighter pilots, but in that case the experience of flow usually comes more from the high stakes involved than the skill; a fight to the death is the ultimate form of human competition. In fact, all competition and our competitive drive is probably rooted in fighting for the means of survival, for inadequate supplies of food, shelter and mates. The computer games that make the most of manual dexterity are the joystick games such as Atari's Combat series and the Apple II Space War game.

The third form of challenge is intellectual, and the supreme example must be chess. The game is so complex that a person can only hope to become a master or grand master by beating other inadequate players, never by actually "mastering" the game. Most computer games are intellectually trivial, and that is one of the reasons they soon lose their fascination. There are two ingredients needed for intellectual challenge in a game, factor complexity and relationship complexity. In chess, the factor complexity is provided by having six different kinds of pieces, each of which has different moves, some having special moves as in castling and en passant, and each having a different influence on the game depending on which square they are on. But the real complexity in chess, and the important one, is the way in which different relationships of pieces make for an entirely different game. Not only are spacial relationships important, but temporal ones as well. That is, not only is the position of the pieces is important, but also who has the next move.

Today, one of the most critical needs in maintaining challenge is continuity of action. In chess, as soon as one challenge ends, another begins. The best vehicle for this in a computer game is real time action, so that while you are deciding what to do about one threat, another develops.

Creativity is our second major factor in creating flow. It is the sense of charting new territory, of looking for the "radical alternative" that often creates a great deal of absorption within programmers. I know that personally I prefer to work on games no one else has done. I love the challenge of the unknown. Perhaps the following example is not strictly a game by some definitions, but computer-generated art is an example of creativity in gaming. The flow comes from seeking more aesthetic algorithms. In simulated games, creativity can be encouraged by increasing both the risks and the rewards for bold patterns of action, while giving poor compensation for playing it safe. That is sometimes the pattern in the business world, where higher risks lead to a possibility of high profit. But creativity is not simply risk-taking, it is also the creation of new patterns and relationships between old parts. I think that chess must have been a much more fascinating game before the standard openings and end game strategies were developed, for then there was the added challenge of

discovering effective patterns for such play.

Imagination in computer games is stimulated by role-playing and fanciful options. There are certain perceptual patterns that stimulate our imagination, and settings such as "King Arthur's Court" or the "Starship Enterprise" invoke those patterns. Role-playing can be enhanced by identification with real or mythical characters, by the use of stock situations, and by names or titles. When the computer asks: "What is your command, Captain Kirk ?", we find it easier to project ourselves into the role of a starship commander, especially if that role is supported by reports that begin: "Lt. Uhura here ...", or "Spock reporting ...".

There are two basic categories of imagination in simulation games, history and fantasy. In historical simulations, it is important to recreate as much as possible a dramatic occasion or suspenseful moment from the past. We want the player to imagine himself a soldier in Caesar's legions, or for that matter, the captain of a clipper ship in 1852. Research and cueing accomplish the identification. In fantasy the task is a little more difficult, for we do not have records of an actual situation to cue the reactions of the player. There are two possible options: to create and populate an artificial universe or to appropriate one from literature, mythology or popular culture. Creating a universe is often difficult. One example might be the game of "Hunt the Wumpus", in which the universe is created in a few words with phrases like, "giant bats", "bottomless pits", and "sucker feet". The advantage of creating a universe is that you are not bound to the literature from which you appropriate the forms.

However, it is not necessary to follow someone else's story line in using their universe. J.R.R. Tolkien uses hundreds of pages to create a fantasy universe in **The Lord of the Rings**. One use of that universe might be to do a simulation of the story, where each player projects himself into the role of a particular character. The other thing that can be done is to realize that many people have formed impressions of dwarves, elves, dragons and goblins from this and similar literature, and that such key words can invoke complex perceptions of a universe. Simply to people your game with elves is to invoke certain images in the mind of a player and stimulate his imagination.

One profitable area will always be the writing of games that essentially, rip off popular culture, especially television shows. I think it is helpful here to realize that almost all popular television shows are formula material built on a single plot. For example, one popular detective show with a woman as the heroine always involves placing her in a sexually threatening situation which she then gets out of with fancy footwork and help from her male colleagues. Another detective show features a shabby detective who outsmarts sharply dressed, upper middle class crooks who don't take him seriously.

A standard plot in formula westerns involves the hero on the white horse, the good woman who is marriage material, the loose woman who relieves sexual tension, the bad guy who threatens the good woman in an implied sexual threat, and the good guy's sidekick (who is usually

crippled, or overweight, or Indian, Mexican, Chinese, Black, or otherwise "unfit" for the leading role.) The good guy destroys the bad guy in a dramatic confrontation, rescues the good woman, and then rides off into the sunset. We watch this kind of show not for its aesthetic value, but because it reinforces our view of the way we believe the world to be and it makes us feel good. I wonder when the minorities are going to realize how racist the treatment of the sidekick is when he is always portrayed as being on the side of good, but inferior?

These standard popular forms can be exploited in two ways. You can use the plot and realize that the appeal comes from reinforced prejudices, or twist the plot around and have the appeal come from rejecting the stereotype. Perhaps you could use a Black hero with a white sidekick. In the movies, the first approach produces the B western and the second the anti-western. Both are mere formulas.

One of the best sources of new universes and plots is mythology. It is surprising how many books, novels, television shows and movies are simply updatings of the old Greek, Teutonic and Norse myths. Hercules is probably the father of Superman, Batman, the Six Million Dollar Man, Wonder Woman, the Hulk and five thousand others. The thing to remember is that the basic elements are so well known that people can have their imagination stimulated by subtle references. And, as soon as you pull a game player out of himself and into an imaginary role, you achieve flow.

Social Interaction is the last of the elements that creates flow, and is, ironically, the most important in human life and the most neglected in computer games. One of the reasons for this neglect is that many computer games attempt to substitute for human interaction. The computer becomes the other player for the person who finds the rest of the world is too busy for him. I think this is a valid role for computers, for most of the world does think they are too busy to play, but it is a sad situation.

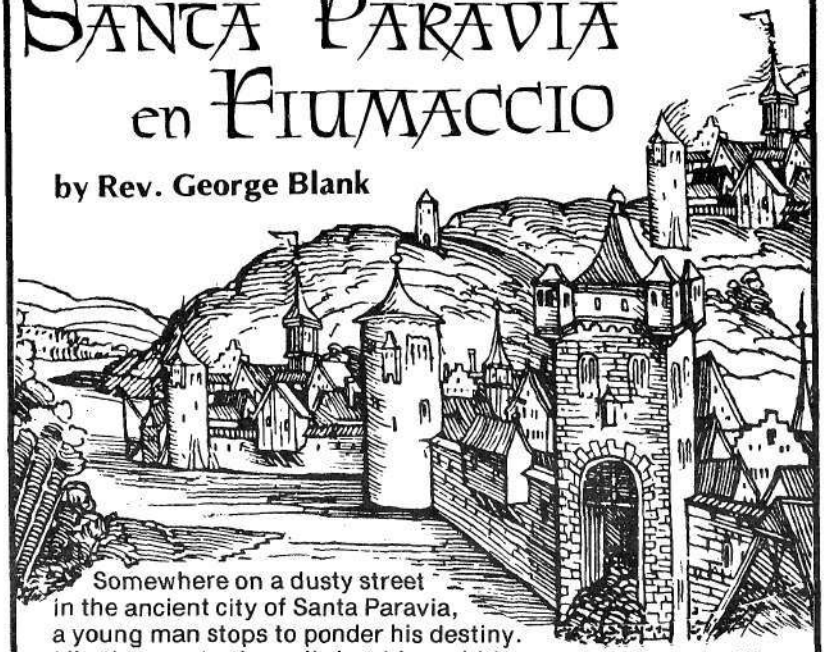
I think it is important for the person who is writing a game as a substitute for human interaction to realize just that, and try to build in some kind of reward for achievement. One of the primary things we do when we play with another person is reinforce our sense of value. In effect, each person is saying to the other: "You're neat, and it is fun to spend time with you." If a computer is to substitute for this affirmation, it is necessary to proclaim: "You are special ... skilled ... better than the rest". One way for this to occur is by having a standard of performance, so that the player can compare himself against other people, or against his previous accomplishment. The message is either you are better than he is or you are getting better and better.

But to my mind, the far better approach is to provide for human interaction during the game. I prefer to write interactive games, although I usually allow for solo play as practice for the real thing.

This covers the basic philosophy and aesthetics of computer gaming. Next month, I will discuss the mechanics, and lead you on a guided tour of the process of writing a game, from idea to marketing, using **'Round the Horn** as an example. □

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. This is the same simulation featured in SoftSide's December 1978 issue, and according to the reviews, it's one game you'll never get tired of playing.

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

TSE TRS-80 Software Exchange

17 Briar Cliff Drive Milford, New Hampshire 03055

David Bolke

ONE QUESTION MOST OFTEN ASKED OF PERSONAL COMPUTING ENTHUSIASTS IS, "WHAT'S IT GOING TO BE LIKE IN TEN OR TWENTY YEARS?"

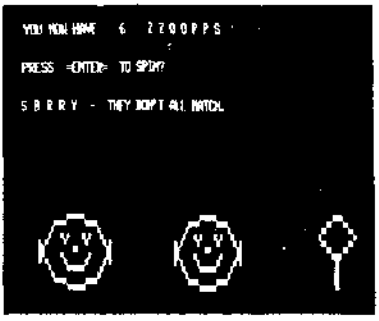
The usual answer invariably points to computers being very much a part of our day to day lives and as common in the average home as the ever-present television set — indeed, maybe even part and parcel of tommorow's "tube".

For many of us, the coming of the computer age is one of many milestones we've been privileged to have witnessed, like the cure for polio, the first man on the moon, and the exploitation of nuclear energy — another notch on our cosmic "pistol grip". But the very young view computers quite differently. For them, computers are no more a cause for wonderment than the automobile was for our generation — but certainly no less.

This program, **Kiddy Slot**, is for children. The graphic characters used in the program are sure to be immediately recognizable, and whether played alone or with a friend, the game is certain to provide a great deal of enjoyment.

Oh ... if you really want to peek into personal computing's future, watch the children play. It will soon become clear that the significance of the computer palls when compared to the play of the game itself. You see, for them, the age of computers is here and now, and has always been.

```
5 REM SUBMITTED BY DAVID BOLKE ON 10/10/78
10 CLS:Z=10
20 PRINT"YOU HAVE TEN ZZOOPPS TO BEGIN THIS GAME.  EACH TIME"
21 PRINT
22 PRINT"THE THREE FIGURES MATCH, YOU WIN FIVE ZZOOPPS.  EACH"
23 PRINT
24 PRINT"SPIN COSTS YOU ONE ZZOOPP.  G O O D  L U C K !"
30 FORX=1TO4000:NEXTX
50 CLS
```




```
72  PRINT:PRINT"YOU NOW HAVE  ";Z;"  Z Z O O P P S"
74 PRINT:INPUT"PRESS  =ENTER=  TO SPIN";A$
90  S=0:T=0:L=0:X=6:Y=33
100  A=RND(3):B=RND(3):C=RND(3)
110  ON A GOSUB200,300,400
120  ON B GOSUB200,300,400
130  ON C GOSUB200,300,400
140 IF(L=3)+(S=3)+(T=3)GOTO600
180  GOTO 640
200  FORD=X+5 TO X+15 STEP10:FORE=0 TO 0+3:SET(E,Y+1):SET(E,Y+10)
210  NEXTE:NEXTD:FORD=X+9 TO X+14:SET(D,Y):SET(D,Y+11):NEXTD
220  D=X+4:E=Y+2:FORK=0 TO 3:SET(D-K,E+K):SET(D+18-K,E+4+K)
230  NEXTK:D=X+1:E=Y+6:FORK=0 TO 3:SET(D+K,E+K):SET(D+18+K,E-4+K)
240  NEXTK:FORE=Y+4 TO Y+7:SET(X,E):SET(X+23,E):NEXTE
250  FORD=X+9 TO X+14:SET(D,Y+8):NEXTD:SET(X+7,Y+3):SET(X+8,Y+4)
261  SET(X+9,Y+3):SET(X+14,Y+3):SET(X+15,Y+4):SET(X+16,Y+3)
270  SET(X+11,Y+5):SET(X+12,Y+5):SET(X+7,Y+6):SET(X+8,Y+7)
280  SET(X+16,Y+6):SET(X+15,Y+7):S=S+1:X=X+46:RETURN
300  FOR D=X+10 TO X+13:SET(D,Y):SET(D,Y+6):NEXTD
310  SET(X+8,Y+1):SET(X+9,Y+1):SET(X+8,Y+5):SET(X+9,Y+5)
```

```
320  SET(X+14,Y+1):SET(X+15,Y+1):SET(X+14,Y+5):SET(X+15,Y+5)
330  SET(X+7,Y+2):SET(X+7,Y+4):SET(X+16,Y+2):SET(X+16,Y+4)
335  SET(X+6,Y+2):SET(X+6,Y+4):SET(X+17,Y+2):SET(X+17,Y+4)
340  SET(X+5,Y+3):SET(X+18,Y+3)
350  FOR D=Y+7 TO Y+11
360  SET(X+11,D):SET(X+12,D):NEXTD
390  T=T+1:X=X+46:RETURN
400  FORD=X+10 TO X+13:SET(D,Y):NEXTD:FORD=X+15 TO X+20
410  SET(D,Y+2):NEXTD:FORD=X+14 TO X+20:SET(D,Y+4):NEXTD
420  FORD=X+10 TO X+16:SET(D,44):NEXTD:SET(X+21,Y+3)
430  SET(X+13,Y+2):SET(X+9,Y+1):SET(X+14,Y+1):SET(X+11,Y+2)
440  SET(X+11,Y+3):SET(X+8,Y+2):SET(X+8,Y+3):SET(X+9,Y+4)
450  SET(X+10,Y+5):SET(X+13,Y+5):SET(X+9,Y+6):SET(X+14,Y+6)
460  SET(X+15,Y+6):SET(X+8,Y+7):SET(X+8,Y+8):SET(X+16,Y+7)
470  SET(X+16,Y+8):SET(X+11,Y+6):SET(X+11,Y+7):SET(X+11,Y+8)
480  SET(X+10,Y+8):SET(X+9,Y+9):SET(X+10,Y+9):SET(X+13,Y+9)
485  SET(X+14,Y+9):SET(X+15,Y+9):SET(X+11,Y+10):SET(X+12,Y+10)
490  L=L+1:X=X+46:RETURN
600 FORS=1TO5
602 FORX=448TO490:PRINT@X,"Y O U   W I N"
604 FORT=1TO5:NEXTT:NEXTX:NEXTS
606 FORX=448TO490:PRINT@X,"H U R R A Y !"
608 FORS=1TO10:NEXTS
609 PRINT@448,"":NEXTX
620 Z=Z+5
639 GOTO50
640 PRINT:PRINT"S O R R Y  -  THEY DON'T ALL MATCH."
660 Z=Z-1
670 IFZ=0GOTO700
690 FORX=1TO1000:NEXTX
699 GOTO50
700 PRINT:PRINT"YOU ARE ALL OUT OF Z Z O O P P S."
710 PRINT"B U T, JUST PRESS  =ENTER=  AND YOU CAN PLAY AGAIN !"
720 INPUTA$
730 Z=10:GOTO50
```

RENUMBER

No, it's not a game, but it can make renumbering your programs seem like child's play!

NOW AVAILABLE
Source Listing
$20.00

If you find yourself renumbering to provide room for additional lines, or just to make things neater, this 1.3K program has got to make your life easier — it can renumber a 12K program like **Treasure Hunt** in just 32 seconds!

The user has complete control over which lines are renumbered and how — including all GOTO's and GOSUB's. You can even renumber the middle of your program and leave the beginning and ending alone. If an undefined line is found, the program will display both the line which caused the error, and the unfound line number, thereby making corrections much easier.

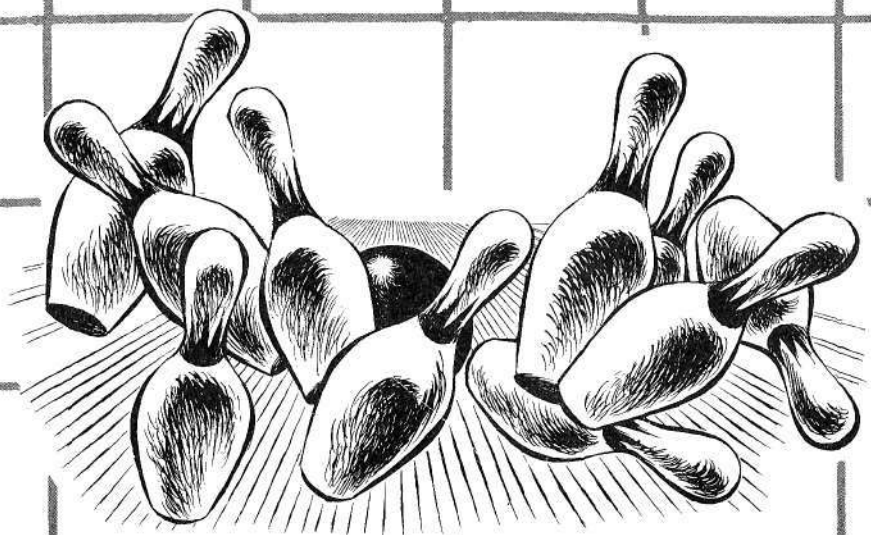
You may have seen other renumbering programs, but none with this many features. No external tables are used. **RENUMBER** runs in 1300 bytes of high memory, regardless of program size, and loads with the SYSTEM command. Versions are available for 4, 16, 32 and 48K machines. Be sure to specify memory size desired, or 16K version will automatically be supplied. Compatible with Disk BASIC.

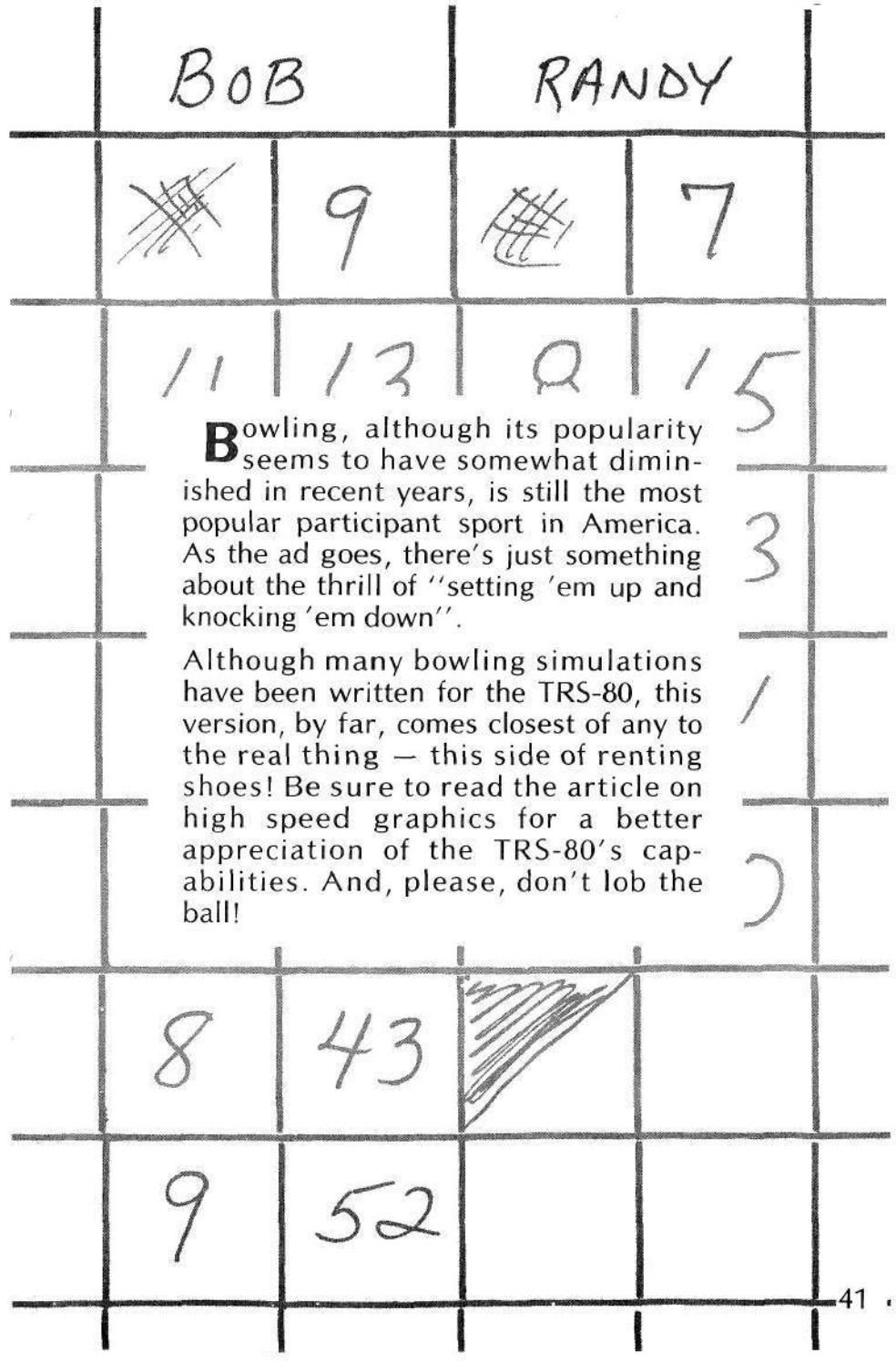
Digital Cassette, Level II — $15.00
Disk, all 4 versions — $25.00

TSE TRS-80 Software Exchange
17 BRIAR CLIFF DRIVE MILFORD, NEW HAMPSHIRE 03055

TEN PIN BOWLING

by Frank B. Rowlett, Jr.





Bowling, although its popularity seems to have somewhat diminished in recent years, is still the most popular participant sport in America. As the ad goes, there's just something about the thrill of "setting 'em up and knocking 'em down".

Although many bowling simulations have been written for the TRS-80, this version, by far, comes closest of any to the real thing — this side of renting shoes! Be sure to read the article on high speed graphics for a better appreciation of the TRS-80's capabilities. And, please, don't lob the ball!

```
10 REM * BOWLING * BY FRANK B. ROWLETT, JR. (10-7-78)
30 CLEAR300:DEFSTRB,G:DEFINTX-Z:GN="###":GA=CHR$(191):GP=GA+CHR$(179)+GA:GL=STRING$(63,CHR$(140)):GB=CHR$(188):GT=CHR$(143):B1="
 ":B2=STRING$(5,CHR$(176)):B3=STRING$(5,GB):B4=STRING$(5,GA):B5=STRING$(5,GT):B6=STRING$(5,CHR$(131)):BP="   "
35 GOSUB400:INPUT"DO YOU WANT INSTRUCTIONS (YES OR NO):";G1:IFASC(G1)=89THENGOSUB1500
40 CLS:G2=CHR$(26):G1=G2+G2+CHR$(29):PRINT@22,CHR$(23);"BOWLING";G1;"USE THE ";CHR$(91);" TO ROLL BALL TO LEFT  (UP)";G1;"USE THE ";
CHR$(92);" TO ROLL BALL TO RIGHT (DOWN)";G1;"USE THE ";CHR$(94);" TO ROLL BALL STRAIGHT AHEAD";G1;
50 INPUT"'ENTER' TO GO ON";G2:RANDOM
60 GOSUB900:FORX=0TO10:FORY=0TO1:XF(Y,X)=0:NEXTY:NEXTX:FORYF=1TO10:FORYP=0TOYN:PRINT@64,CHR$(30);:IFYP=0PRINT@64,G1;:ELSEPRINT@64,G2

70 PRINT"'S TURN";:GOSUB200:PRINT@834,"'SPACE' BAR FOR NEXT BOWLER";:GX="":XY=0
90 GX=INKEY$:IFGX=""THEN90ELSEPRINT@834,STRING$(34," ");:NEXTYP:NEXTYF:PRINT@64,"'ENTER' TO PLAY AGAIN";:INPUTG1:GOTO30
98 REM * SET MARK ON SCORE SHEET *
99 FORX=0TOXM:SET(X+24+10*YF,8+YP*6):NEXTX:RETURN
100 XP=10:IFPOINT(118,24)THENXP=XP-1
110 IFPOINT(108,27)THENXP=XP-1
120 IFPOINT(98,30)THENXP=XP-1
130 IFPOINT(118,30)THENXP=XP-1
140 IFPOINT(88,33)THENXP=XP-1
150 IFPOINT(108,33)THENXP=XP-1
160 IFPOINT(98,36)THENXP=XP-1
170 IFPOINT(118,36)THENXP=XP-1
180 IFPOINT(108,39)THENXP=XP-1
```

```
190 IFPOINT(118,42)THENXP=XP-1
192 RETURN
199 REM * PLAY *
200 GOSUB1100:XT=0:GOSUB800:XT=1:GOSUB100:IFPOINT(25+10*(YF-1),8+YP*6)THEN350
220 IFPOINT(24+10*(YF-1),8+YP*6)=-1ANDPOINT(25+10*(YF-1),8+YP*6)=0THENX=YF-1:GOSUB370:GOSUB300:GOSUB390
230 X=YF:GOSUB370:IFXP=10THENXM=1:GOSUB99:GOTO300
240 GOSUB800:Y=XP:GOSUB100:XP=XP-Y:X=YF:GOSUB370
250 IFPOINT(25+10*(YF-1),8+YP*6)THENX=YF-1:GOSUB370:GOSUB300:GOSUB390
270 IFXP+Y<10THEN290ELSEXM=0:GOSUB99:IFYF<10THENRETURN
280 GOSUB1100:XT=0:GOSUB800:GOSUB100:X=YF:GOSUB370:IFXP=10THENFORY=0TO1:SET(122+Y,8+6*YP):NEXTY
290 X=YF:GOSUB300:IFYF=10THENRETURNELSEGOTO390
300 IFYF<10THENRETURNELSEGOSUB1100:XT=0:GOSUB800:XT=1:GOSUB100:X=YF:GOSUB370
305 IFPOINT(25+10*(YF-1),8+YP*6)THENX=YF-1:GOSUB370:GOSUB300:GOSUB390
307 IFXP=10THENFORY=0TO2:SET(122+Y,8+6*YP):NEXTY:GOTO330
310 GOSUB800:Y=XP:GOSUB100:XP=XP-Y:X=YF:GOSUB370:IFXP+Y=10THENSET(122,8+YP*6)
320 X=YF:GOTO300
330 GOSUB1100:XT=0:GOSUB800:XT=1:GOSUB100:X=YF:GOSUB370:IFXP<10THEN320
340 FORY=0TO1:SET(120+Y,8+6*YP):NEXTY:GOTO320
350 IFPOINT(25+10*(YF-2),8+YP*6)THENX=YF-2:GOSUB370:GOSUB300:GOSUB390
360 X=YF-1:GOSUB370:GOTO220
370 XF(YP,X)=XF(YP,X)+XP:RETURN
```

```
380 PRINT@201+5*X+YP*128,;:PRINTUSINGGN;XF(YP,X);:RETURN
390 XF(YP,X+1)=XF(YP,X+1)+XF(YP,X):RETURN
399 REM * PRINT HEADING *
400 CLS:PRINT@26,"BOWLING":PRINT:RETURN
449 REM * GET AND ENTER KEY *
450 PRINTSTRING$(18," ");"(PRESS ";CHR$(34);"ENTER";CHR$(34);" TO CONTINUE)";:INPUTG1:GOTO400
499 REM * BOUNCE BALL BACK AND FORTH *
500 X=ABS(Z)+1:Y=514
510 IFX>3THENX=X-3:Y=Y+64:GOTO510
530 ONXGOTO540,550:PRINT@Y,B2;:PRINT@Y+64,B4;:PRINT@Y+128,B6;:RETURN
540 PRINT@Y,B4;:PRINT@Y+64,B5;:IFZ=0RETURNELSEPRINT@Y-64,B1;:RETURN
550 PRINT@Y,B3;:PRINT@Y+64,B4;:IFY=834THENRETURNELSEPRINT@Y+128,B1;:RETURN
599 REM * ROLL BALL FIRST PART OF ALLEY *
600 FORX1=0TOX2:ONXGOTO620,630:GOSUB700:GOTO640
620 GOSUB710:GOTO640
630 GOSUB720
640 Y=Y+1:NEXTX1:RETURN
700 PRINT@Y," ";B2;:PRINT@Y+64," ";B4;:PRINT@Y+128," ";B6;:RETURN
710 PRINT@Y," ";B4;:PRINT@Y+64," ";B5;:RETURN
720 PRINT@Y," ";B3;:PRINT@Y+64," ";B4;:RETURN
799 REM * PREPARE BALL TO ROLL *
800 X2=34:GX="":FORZ=0TO16:GOSUB500:GX=INKEY$:IFGX=""THENNEXTZELSEGOTO830
```

```
810 FORZ=-16TO0:GOSUB500:GX=INKEY$:IFGX=""THENNEXTZELSEGOTO830
820 GOTO800
830 IFASC(GX)=91THEN1200
840 IFASC(GX)=10THEN1400
850 IFASC(GX)<9THENNEXTZ
860 GOSUB600:X2=19:GOSUB600:PRINT@Y,B1;:PRINT@Y+64,B1;:IFX=3PRINT@Y+128,B1;
870 IFABS(Z)=2THENPRINT@758,BP;:PRINT@827,BP;ELSEIFABS(Z)=14THENPRINT@699,BP;:PRINT@758,BP;ELSEIFABS(Z)=5THENPRINT@571,BP;:PRINT@827
,BP;ELSEIFABS(Z)=11THENPRINT@955,BP;:PRINT@699,BP;
880 RETURN
899 REM * GET NAMES OF BOWLERS *
900 YN=0:G1="PLAYER":G2="":GOSUB400:INPUT"BOWLER NO. 1:";G1:IFLEN(G1)>12THENG1=LEFT$(G1,12)
910 PRINT:PRINT"PLAYER NO. 2 (IF ONLY ONE PLAYER, HIT 'ENTER'):":INPUTG2:IFLEN(G2)>0THENYN=1:IFLEN(G2)>12THENG2=LEFT$(G2,12)
999 REM * SET SCREEN *
1000 GOSUB400:FORX=128TO384STEP128:PRINT@X,GL;:NEXTX:PRINT@448,GL;:PRINT@960,GL;
1010 FORX=141TO191STEP5:PRINT@X,GB;:PRINT@X+64,GA;:PRINT@X+128,GA;:PRINT@X+192,GA;:PRINT@X+256,GT;:NEXTX
1020 PRINT@448,GB;:PRINT@511,GB;:PRINT@960,GT;:POKE16383,143:FORX=512TO896STEP64:PRINT@X,GA;:PRINT@X+63,GA;:NEXTX
1040 FORX=1TO9:PRINT@395+5*X,RIGHT$(STR$(X),1);:NEXTX:PRINT@444,"10";:PRINT@192,G1;:PRINT@320,G2;:RETURN
1099 REM * SET PINS UP *
1100 PRINT@571,GP;:PRINT@630,GP;:PRINT@689,GP;:PRINT@699,GP;:PRINT@748,GP;:PRINT@758,GP;:PRINT@817,GP;:PRINT@827,GP;:PRINT@886,GP;:P
RINT@955,GP;:RETURN
1199 REM * BALL TO BREAK LEFT *
1200 GOSUB600:FORX1=0TO9:X=X-1:IFX=0THENX=3:Y=Y-64:IFY<514PRINT@Y+64,B1;:PRINT@Y+128,B1;:GOTO1280
1210 FORX2=0TO1:ONXGOTO1220,1230:GOSUB700:GOTO1240
```

```
1220 GOSUB710:GOTO1240
1230 GOSUB700:PRINT@Y+128," ";B1;
1240 Y=Y+1:NEXTX2:NEXTX1:PRINT@Y,B1;:PRINT@Y+64,B1;:IFX<3THEN1250ELSEPRINT@Y+128,B1;
1250 IFXT=0ANDABS(Z)=13PRINT@886,BP;:PRINT@571,BP;:PRINT@827,BP;:PRINT@955,BP;
1260 IFXT=0ANDABS(Z)=15PRINT@886,BP;:PRINT@827,BP;:PRINT@955,BP;
1270 IFXT=0ANDABS(Z)=14PRINT@827,BP;:PRINT@886,BP;:XY=1
1280 IFXY=1ANDABS(Z)=9ANDRND(3)=1THENPRINT@955,BP;
1299 REM * TEST FOR PINS DOWN *
1300 IFPOINT(118,25)ANDPOINT(123,25)THEN1310ELSEPRINT@571,BP;
1310 IFPOINT(108,28)ANDPOINT(113,28)THEN1320ELSEPRINT@630,BP;
1320 IFPOINT(98,31)ANDPOINT(103,31)THEN1330ELSEPRINT@689,BP;
1330 IFPOINT(118,31)ANDPOINT(123,31)THEN1340ELSEPRINT@699,BP;
1340 IFPOINT(88,34)ANDPOINT(93,34)THEN1350ELSEPRINT@748,BP;
1350 IFPOINT(108,34)ANDPOINT(113,34)THEN1360ELSEPRINT@758,BP;
1360 IFPOINT(98,37)ANDPOINT(103,37)THEN1370ELSEPRINT@817,BP;
1370 IFPOINT(118,37)ANDPOINT(123,37)THEN1380ELSEPRINT@827,BP;
1380 IFPOINT(108,40)ANDPOINT(113,40)THEN1390ELSEPRINT@886,BP;
1390 IFPOINT(118,43)ANDPOINT(123,43)THENRETURNELSEPRINT@955,BP;:RETURN
1399 REM * BALL TO BREAK RIGHT *
1400 GOSUB600:FORX1=0TO9:X=X+1:IFX=4THENX=1:Y=Y+64
1405 IF(X=1ANDY>893)OR(X=3ANDY>833)PRINT@Y-64,B1;:PRINT@Y,B1;:PRINT@Y+64,B1;:GOTO1480
```

```
1410 FORX2=0TO1:ONXGOTO1420,1430:GOSUB700:GOTO1440
1420 GOSUB710:PRINT@Y-64,B1;:GOTO1440
1430 GOSUB720
1440 Y=Y+1:NEXTX2:NEXTX1:PRINT@Y,B1;:PRINT@Y+64,B1;:IFX<3THEN1450ELSEPRINT@Y+128,B1;
1450 IFXT=0ANDABS(Z)=3PRINT@630,BP;:PRINT@571,BP;:PRINT@699,BP;:PRINT@955,BP;
1460 IFXT=0ANDABS(Z)=1PRINT@630,BP;:PRINT@571,BP;:PRINT@699,BP;
1470 IFXT=0ANDABS(Z)=2PRINT@699,BP;:PRINT@630,BP;:XY=1
1480 IFXY=1ANDABS(Z)=7ANDRND(3)=1THENPRINT@571,BP;
1490 GOTO1300
1499 REM * INSTRUCTIONS *
1500 GOSUB400:PRINT"THIS GAME SIMULATES TEN-PIN BOWLING.  IT ALLOWS ONE BOWLER TO":PRINT"PLAY A PRACTICE GAME OR FOR TWO BOWLERS TO
COMPETE AGRINST EACH OTHER.":PRINT
1510 PRINT"A GAME CONSISTS OF TEN FRAMES (TURNS) FOR EACH BOWLER.  IF":PRINT"THERE ARE TWO BOWLERS, EACH GETS TO BOWL A FRAME BEFORE
 GOING":PRINT"TO THE NEXT SET OF FRAMES.":PRINT
1520 PRINT"EACH BOWLER GETS UP TO TWO BALLS TO KNOCK ALL THE PINS DOWN":PRINT"DURING HIS FRAME.  IF THE BOWLER KNOCKS ALL THE PINS D
OWN WITH":PRINT"THE FIRST BALL IN THE FRAME, THIS IS CALLED A ";CHR$(34);"STRIKE.";CHR$(34);"  A"
1530 PRINT"STRIKE IS SCORED IN THE FRAME AS 10 PLUS THE NUMBER OF PINS":PRINT"KNOCKED DOWN BY THE BOWLER WITH HIS NEXT TWO BALLS.  A
 STRIKE":GOSUB450
1540 PRINT"IS INDICATED IN A FRAME IN THE FOLLOWING MANNER:  ";CHR$(191);STRING$(3,CHR$(131));CHR$(143);CHR$(191);CHR$(26);STRING$(6
,CHR$(24));CHR$(191);"    ";CHR$(191);CHR$(26);STRING$(6,CHR$(24));STRING$(6,CHR$(131))
1550 PRINT:PRINT"IF THE BOWLER KNOCKS ALL THE PINS DOWN WITH TWO BALLS IN THE":PRINT"FRAME, THIS IS CALLED A ";CHR$(34);"SPARE.";CHR
$(34);"  A SPARE IS SCORED AS 10 PLUS":PRINT"THE NUMBER OF PINS KNOCKED DOWN WITH THE BOWLER'S NEXT BALL."
```

```
1560 PRINT"A SPARE IS INDICATED IN A FRAME IN THE FOLLOWING MANNER:  ";CHR$(191);STRING$(3,CHR$(131));CHR$(135);CHR$(191);STRING$(6,
CHR$(24));CHR$(191);"    ";CHR$(191);STRING$(6,CHR$(24));STRING$(6,CHR$(131))
1570 PRINT"IF THE BOWLER DOESN'T KNOCK DOWN ALL THE PINS WITH HIS TWO":PRINT"BALLS IN THAT FRAME, IT IS AN OPEN FRAME AND HE GETS TH
E SCORE":GOSUB450
1580 PRINT"OF THE NUMBER OF PINS HE KNOCKED DOWN WITH THE TWO BALLS.":PRINT:PRINT"IF A BOWLER GETS A STRIKE OR A SPARE IN HIS LAST F
RAME, HE IS":PRINT"ALLOWED TO ROLL THE REMAINING BALLS TO GET HIS FINAL SCORE":PRINT"BEFORE THE NEXT BOWLER'S TURN."
1590 PRINT:PRINT"SCORING AND POSTING OF THE SCORE IS HANDLED BY THE COMPUTER.":PRINT"THIS INFORMATION IS GIVEN ONLY TO ACQUAINT YOU
WITH THE":PRINT"SCORING METHODS.":PRINT
1600 PRINT"WHEN THE BALL IS READY TO BE THROWN, IT MOVES FROM SIDE TO SIDE":PRINT"IN THE ALLEY.  TO THROW THE BALL, YOU WAIT UNTIL I
T IS IN THE":PRINT"POSITION ACROSS THE ALLEY YOU WANT, AND THEN YOU PRESS ONE OF":GOSUB450
1610 PRINT"THE THREE ARROW KEYS THAT CONTROLS HOW YOU THROW THE BALL DOWN":PRINT"THE ALLEY.  WHEN THE ARROW KEY YOU SELECT IS PRESSE
D, THE BALL":PRINT"WILL THEN TRAVEL DOWN THE ALLEY TOWARDS THE PINS.":PRINT
1620 PRINT"THE THREE ARROW KEYS USED ARE:":PRINT:PRINT"   ";CHR$(94);"  TO THROW THE BALL STRAIGHT DOWN THE ALLEY":PRINT:PRINT"   ";
CHR$(91);"  TO CAUSE THE BALL TO BREAK TO THE LEFT (UP) AS IT TRAVELS":PRINT"       DOWN THE ALLEY"
1630 PRINT:PRINT"   ";CHR$(92);"  TO CAUSE THE BALL TO BREAK TO THE RIGHT (DOWN) AS IT":PRINT"       TRAVELS DOWN THE ALLEY":GOSUB450
1640 PRINT"THE BOWLERS SCORE IS BASED ON HIS SKILL AT THROWING THE BALL":PRINT"IN THE RIGHT DIRECTION AT THE RIGHT TIME (THE SAME AS
 IN REAL":PRINT"BOWLING).  THE ONLY CHANCE INTRODUCED IS WHEN THE BOWLER HAS"
1650 PRINT"A ";CHR$(34);"7-10 SPLIT";CHR$(34);" (THE RIGHTMOST AND THE LEFTMOST PIN LEFT AFTER":PRINT"THE FIRST BALL).  IF THE BOWLE
R THROWS THE BALL CORRECTLY,":PRINT"HE HAS ONE CHANCE IN THREE OF KNOCKING BOTH PINS DOWN TO GET":PRINT"A SPARE IN THAT FRAME."
1660 PRINT:PRINT"ONE THING YOU SHOULD BE AWARE OF--AS IN REAL BOWLING, A":PRINT"BOWLER CANNOT GET A STRIKE BY THROWING THE BALL STRA
IGHT AHEAD.":PRINT"TO GET A STRIKE, THE BALL MUST BREAK TO THE LEFT OR THE RIGHT.":PRINT
1670 PRINT"--GOOD LUCK!":GOTO450
```

So Your Computer Wants to Play Chess?...

...then why not start off with the best?

SARGON

The recent winner of the 1978 San Jose Microcomputer Chess Tournament, SARGON, Kathey and Dan Spracklen's revolutionary chess-playing program, left spectators slackjawed as it soundly defeated a formidable field of challengers. Among those bested were:

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Microchess 1.5
Chess Challenger -3
Chess Challenger -10
Boris
Atari

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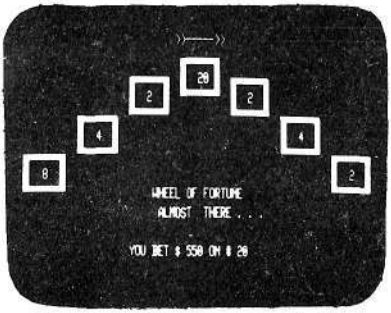
Where it stops, not even the computer knows, in this simulation of a circus-type wheel of fortune. Includes barker, complete with a set of wise remarks — **fun for the whole family !**



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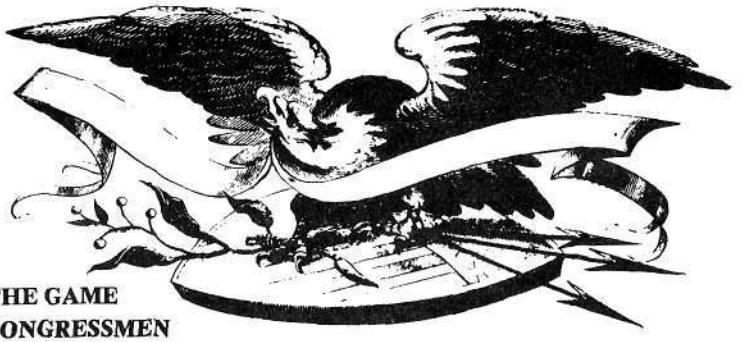
PORK BARREL



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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HIGH SPEED GRAPHICS

For the TRS-80 Computer

by Frank B. Rowlett, Jr.

Both the Level I and II TRS-80 computers have the capability of displaying graphic images on the screen of the monitor. The display is divided into 16 rows of 64 character positions. Each character position is further divided into 6 graphic blocks (2 across by 3 down) giving 48 rows of 128 graphic blocks. The graphic images are produced by "turning on" the appropriate graphic blocks on the screen.

In both Level I and Level II BASIC, the SET statement is used to turn these graphic blocks on (the RESET statement is used to turn the graphic blocks off). The only difference between the two BASICS is that the Level II is a little faster than the Level I. Both require that you specify the horizontal (from 0 to 127) and the vertical (from 0 to 47) position of the graphic block. The statements will then either turn on or turn off that particular block . . . and no others.

What happens in the TRS-80 is that the SET and RESET statements alter the character at the print position the graphic block occupies. This is why an alpha-numeric character cannot exist in a character position with any turned-on graphic block. Handling graphic blocks one at a time like this is slow, so if you have a large graphic image to draw, it takes a while to display it on the screen.

In Level II BASIC, there are two other options for putting graphic images on the screen: the POKE statement and the PRINT statement. Both of these put one of the 64 graphic characters (counting a blank) in a print position on the screen.

Using the POKE statement to put graphic images on the display screen is described in the Level II BASIC user's manual. All you do is POKE the desired graphic character into the memory positions reserved for holding the characters that are displayed on the screen (memory positions 15360 to 16383). Thus, it is possible to display a complex graphic image on the screen in about one-sixth the time it would take using the SET statement.

While the POKE statement is faster than the SET statement, the PRINT statement is the fastest. By using the PRINT statement and printing a whole string of graphic characters (it's possible to get over

```
10 REM             HIGH-SPEED GRAPHICS DEMO
20 REM                BY FRANK ROWLETT
30 REM
80 REM             USING THE 'SET' STATEMENT
90 REM
100 CLS:FORY=0TO47:FORX=0TO127:SET(X,Y):NEXTX:NEXTY
110 GOTO110
180 REM            USING THE 'POKE' STATEMENT
190 REM
200 CLS:FORX=15360TO16383:POKEX,191:NEXTX
210 GOTO210
280 REM            USING THE 'PRINT' STATEMENT
290 REM
300 CLS:CLEAR300:C$=STRING$(192,CHR$(191)):PRINTC$;C$;C$;C$;C$;STRING$(63,CHR$(191));:POKE16383,191
310 GOTO310
380 REM     DEMONSTRATION OF HIGH SPEED IMAGE PRINTING
390 REM
400 CLEAR300:C1$=CHR$(26)+STRING$(9,CHR$(24)):C$=CHR$(191)+CHR$(131)+STRING$(5,CHR$(179))+CHR$(131)+CHR$(191)+C1$+CHR$(191)+" "+CHR$
(191)+" "+CHR$(140)+" "+CHR$(191)+" "+CHR$(191)+C1$+CHR$(191)+CHR$(176)+STRING$(5,CHR$(179))+CHR$(176)+CHR$(191)
410 CLS:PRINT@RND(54)-1+(RND(14)-1)*64,C$;:FORX=0TO500:NEXTX:GOTO410
480 REM
490 REM
500 REM                    FIGURE 2
```

Figure 1

200 graphic characters in one string), you can greatly increase the speed of displaying a complex graphic image.

To illustrate this, I have written the program in Figure 1. It uses the three different types of statements to fill (white out) the screen with graphic images. The SET statement is used in lines 100 and 110, the POKE statement is used in lines 200 to 210, and the PRINT statement is used in lines 300 to 310. Note the POKE statement in 300; its function is to set the lowest, rightmost position on the screen. If you try to print at that position, the screen will scroll up one line.

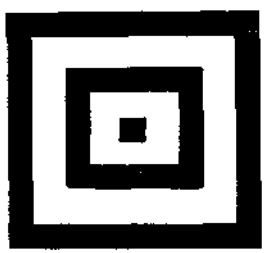

Figure 2

If you type RUN 100, it takes about 47 seconds to fill the screen totally with graphic characters. If you type RUN 200 it takes about 6.7 seconds to fill the screen; and if you type RUN 300 it takes about .6 (yes, six-tenths) of a second to fill the screen. Thus, you can see that by using PRINT to place graphic images you can dramatically reduce the amount of time it takes to generate one on the screen.

There are a number of other tricks you can use with the PRINT statement and graphic characters to speed up producing graphic images. For example, if you use the same graphic image (even if it covers several lines) in several places on the screen, you can construct the image in a string that will print it with a single PRINT statement. This is done by using control code characters to position the cursor on the screen during the printing.

Suppose you wanted to produce the image shown in Figure 2 anywhere on the screen. The code to produce that image as a single string is shown in line 400 of the program in Figure 1. To print that graphic image anywhere on the screen, use the PRINT @ statement and begin printing it at the first character position of the location you want the image to appear at on the screen. Typing RUN 400 will demonstrate this by putting the graphic image randomly on the screen, leaving it a few seconds, then moving it to another location on the screen.

The above example also illustrates another trick that is useful for general printing as well as displaying graphic images. It shows how the cursor can be controlled during the execution of a PRINT statement by the use of the control code characters. By printing these characters in conjunction with the data to be displayed, one PRINT statement can be used in place of several. Also note how two or more of these characters can be combined together into a string that can be used throughout a program.

There are endless possibilities for screen control by using these techniques. The limits will only be defined by your imagination and needs. ❑

MICRO TEXT EDITOR

This program makes text composition and editing on the TRS-80 a breeze. It features a non-destructible cursor, versatile editing options, graphics capability, and interfaces with cassette tape or either TRS-80 printer. Commands include:

DELETE	Deletes one or any number of spaces
INSERT	Inserts one of any number of characters into existing text
ASCII CODE	Allows insertion of any character or graphic character into the text
REPEAT	Allows any character to be printed repeatedly in the text
PRINT	Contents of screen will be copied onto TRS-80 line printer
SAVE	Contents of screen will be saved on the cassette tape
LOAD	Allows data on tape to be reloaded onto the screen
CLEAR	Clears the screen and moves the cursor to starting position
END	Clears end-of-text of trailing blanks

Home Financial Management

by M. D. Kelleher

Turn Your Computer Into A Personal Financial Advisor!

If you've been waiting for a personal finance program that's easy to use, yet complete enough to be of real use in your home, check out this list of features:

- Cost of Borrowing
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- Loan Payment Amount
- Savings Growth Balance
- Growth of Regular Savings Deposits
- Dividends and Withdrawals
- Earned Interest Rate on Savings and Investments
- True Cost of an Automobile
- Probability of Obtaining a Loan
- Establishment of a Household Budget

Try doing all that on your household calculator ... or better yet, buy the program — it's cost-effective.

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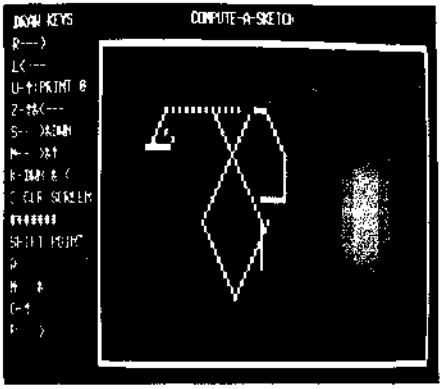
Comput-A-Sketch

by Albert C. Blackwell, Jr.

SKETCHING ON TO A GOOD THING



Most children like to doodle ... especially us 'older' ones. For many years a mechanical sketch toy has been very popular with kids of all ages. It seems that people just tend to think better with a stylus in their hand, whether on the phone, talking up that big business deal or speaking in a classroom.

Often, it's hard to get the very young interested in the micro-computers. The time required to master many games and programs often exceeds their limited attention spans. With this game, **Comput-A-Sketch**, they too, will want to get in on the family computer action. They can doodle, sketch designs, pictures, Mom and Dad can even show their stuff. Unlike the old mechanical toy, or some of the 'repeating' TV games, this program incorporates a floating stylus that should give added potential to your artistic skills.

INSTRUCTIONS

Once the program has been run, there's no need to use the ENTER key. The INKEY function eliminates that chore.

DRAW KEYS do the actual drawing.

SHIFT POINT KEYS move the stylus point around and do not draw. They will erase, however, should you run across a line. To restore a section, type two draw points and move away at right angles.

BOUNDRY lines cannot be crossed. Lines 320-350 restore the point to the inside when the boundry is approached.

TO ERASE sketch, press C key and it automatically clears the screen and refreshes the sketching pad and instructions at left on the screen. [**No need to memorize them**]

PRACTICE and after a few rounds you'll improve your skills. If not, move over and let your kids show you how it's done.

```
5 'COMPUTE-A-SKETCH ALBERT C BLACKWELL JR. 1978
10 ' MEMORY USED 915
15 INPUT"WHEN READY TO BEGIN, PRESS ENTER";B$:CLS:GOSUB200
20 X=75:Y=25
30 A$=INKEY$
40 IF A$="C"CLS:GOTO 10
50 IF A$="R" THEN X=X++1
60 IF A$="Q" RESET(X,Y):X=X-1
70 IF A$="P" RESET(X,Y):X=X+1
80 IF A$="W" RESET(X,Y):Y=Y+1
90 IF A$="O" RESET(X,Y):Y=Y-1
100 IF A$="U" THEN Y=Y-1
110 IF A$="K" THEN X=X-1:Y=Y+1
120 IF A$="M" THEN X=X+1:Y=Y-1
130 IF A$="L" THEN X=X-1
140 IF A$="Z" THEN X=X-1:Y=Y-1
150 IF A$="D" THEN Y=Y+1
160 IF A$="S" THEN X=X+1:Y=Y+1
170 GOSUB 320
180 SET(X,Y)
190 GOTO 30
200 PRINT "DRAW KEYS                    COMPUTE-A-SKETCH"
210 PRINT"R--->":PRINT"L<---":PRINT"U-[:PRINT"D-DWN"
220 PRINT"Z-[&<---":PRINT"S--->&DWN":PRINT"M--->&["
230 PRINT"K-DWN & <---":PRINT"C-CLR SCREEN"
240 PRINT"*******":PRINT"SHIFT POINT":PRINT"Q---":PRINT"M---&  "
250 PRINT"O-[":PRINT"P--->";
260 FOR Y=4TO47:X=26:SET(X,Y):NEXT
270 FOR X=26TO127:Y=47:SET(X,Y):NEXT
280 FORY=4TO47:X=127:SET(X,Y):NEXT
290 FORX=26TO127:Y=4:SET(X,Y):NEXT
300 X=75:Y=25
310 RETURN
320 IFX=26 THEN X=27
330 IFY=5 THEN Y=6
340 IF X=125 THEN X=124
350 IF Y=46 THEN Y=45
360 RETURN
```

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- **Stress relief notches help prevent damage to disc jacket**
- **Write-enable notch permits read-only or read/write**

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GAMES

MASTERMIND by Lance Micklus
Lots of digital MASTERMIND programs create a code and give you the clues; this one also lets you make the code and give the clues. You can play either way or take turns with the computer. Since this is a machine language program, it takes the computer three seconds or less to come up with a guess. Both Level I and II versions are supplied. (Level I loads with CLOAD command and Level II with SYSTEM command — file name MSTR) Program loads into memory addresses 5000 to 7FFO, thus requires 16K of memory.

Level I or II, 16K Price, $7.95
Source Listing Price, $20.00

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

'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!

Reg. $9.95 Level II, 16K Price, $7.95

SCI-FI SAMPLER by Tim Quinlan
Three science fiction games in one program: Lunar Lander, Star Monster, and Space Battle. Instructions are part of the program along with the graphic displays.

Level I or II, 4K Price, $5.95

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

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,$7.95

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 fuedal 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. For Level II, 16K Price,$9.95

WHEEL OF FORTUNE by Russell Starkey
Round and round it goes, where it stops, not even the computer knows, in this simulation of a circus-type wheel of fortune. Includes barker, complete with a set of wise remarks — fun for the whole family! Level II 4K Price, 4.95

PILLBOX by Gene Perkins
A simulated artillery battle between two fixed implacements. 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

OTHELLO III by Tim Quinlan
A strategy game played on an 8 x 8 board. The object of the game is to capture as many squares as possible. Interesting graphics display. You can play against the computer, a friend or have the computer oppose itself. Level I and II, 4K Price,$5.95

REMAINDER by Lance Micklus
A great way to show off your TRS-80. "Find my number" game for people with 64K of head space. **Warning:** Don't leave this game loaded in your computer and walk away — when you return, you'll find a crowd playing this game (Worse yet, they won't let you have your machine back) Levell and II, 4K Price,$4.95

TIME BOMB by David Bohlke
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,$7.95

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

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

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,$4.95

TRS-80 SLOT MACHINE by Circle Enterprises
A simulation of a typical 3-reel casino slot machine with ten payoff combinations ranging from $2 to $200. Features full graphics display. Level I or II,4K Price,$5.95

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

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

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

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

GAMES/GROUP I by Tim Quinlan
Four computer games in one package, Hammurabi, Concentration I, Russian Roulette and UFO. For Level I or II, 4K Price, $5.95

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 — $14.95

DISK SOFTWARE

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 DOS2.1.

Price, $59.95

FOR TRS-80 LEVEL II

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

INVENTORY SYSTEM 2.1

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. If you need information in depth, consider Inventory 2.2 as an alternative. Price, $39.95

DISK PROGRAMS ON THESE PAGES
MAY BE ORDERED DIRECTLY FROM

TRS-80 Software Exchange

17 Briar Cliff Drive Milford, New Hampshire 03055

PETALS AROUND THE ROSE by Circle Enterprises
A TRS-80 implementation of the dice game/puzzle described in the Sept/Oct 1977 issue of **Personal Computing** magazine. The game is both challenging and frustrating to most people. For Level I or II, 4K Price, $5.95

HANGMAN, 2-PLAYER OR SOLITARY by Russell Starkey
The familiar game of Hangman, just the way you remember playing. Excellent graphics.
Level I or II, 4K Price, $4.95

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

SPELLING BEE by Lance Micklus
Displays a correctly spelled word, than asks player to type it out on the keyboard. The words are chosen at random and their order is not duplicated from one session to another. May be periodically updated by changing the words in the DATA statements to correspond with the student's expanding vocabulary. Level II, 4K Price, $4.95

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

KALEIDOSCOPE
A simple graphic program in which the screen is put under the control of random subroutines that produce a four-quadrant balanced pattern.
Level I, 4K Price, $4.95

SARGON by Kathey and Dan Spracklen
The recent winner of the 1978 San Jose Microcomputer Chess Tournament, SARGON, Kathey and Dan Spracklen's revolutionary chess-playing program, left spectators slackjawed as it soundly defeated a formidable field of challengers. In the repidly changing world of computer chess, SARGON seems destined to reign supreme for quite some time to come. Why not get in on the fun today?
Level II, 16K Price, $19.95

MICROCHESS by Peter Jennings
The cutmination 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 and Level II, 4K — $19.95

BUSINESS PROGRAMS

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

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. All versions include **Reports, Cost/Value Summary, Reorder Search, Index, Detailed Report, Read and Write File, Data Change.** Comes in three different versions (specify version when ordering)

Version I 240 stock items can be contained using the full 8 data areas and 2 pieces of alpha information

Version II 290 stock items can be contained using 6 data areas and 2 pieces of alpha information

Version III 450 stock items, simplified report with no reorder search, allows 1 piece of alpha information (description) and 3 data areas (quantity on hand, cost price, sales history)

Level I or II, 16K Price, $20.00

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

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

ACCOUNTS RECEIVABLE by M.D. Kelleher
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

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

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

MOVING SIGNBOARD by Circle Enterprises
A machine language program designed to use the TRS-80 as a display device. User may type in up to a full screen of text, store it in memory and then cause it to crawl across the screen in the fashion of an electronic marquee. Level I or II, 4K Price, $9.95

PERSONAL PROGRAMS

BIORHYTHMS by Frank B. Rowlett, Jr.
There is a theory that everyone is subject to a group of life cycles which effect 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

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

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

MORTGAGE CALCULATION by Russell Starkey
An amortized loan schedule, displaying a complete list of payments showing interest and principal portions of each, plus accumulated interest and principal at each payment and remaining balance. Level II, 4K

Price, $4.95

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

SPECIAL PURPOSE PROGRAMS

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
Source Listing Price, $20.00
All 4 versions on DISK Price, $25.00

TEST FOR INDEPENDENT VARIABLES by Stephen Hebbler
Computes for Mean, Standard Deviation, N, Degrees of Freedom, and Probability of Occurrence. For Level I or II, 4K Price, $5.95

KEYBOARD 80 by John Adamson
Plays music on your TRS-80 keyboard. A machine language program which loads with SYSTEM command. Three-octave diatonic scale organ lets you play many of your favorite songs right on the computer's keyboard! Simply load program and plug the "AUX" line into any audio amplifier and play.
Level II, 16K Price, $9.95

HAM RADIO
A versatile time-keeping program which tracks local, Greenwich Mean, elapsed time and flashes prompts for station identification at proper intervals.
Level I or II, Price, $

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

TSE TRS-80 Software Exchange

SOFTWARE ORDER FORM

DESCRIPTION	LEVEL	COST
	TOTAL	

*Special prices for feature programs in effect 60 days from date of mailing.

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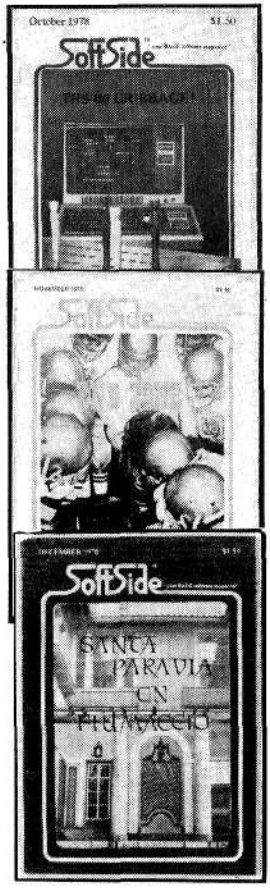

October

Cribbage—you vs. computer played by standard rules **State Capital Quiz**—a challenging geography game for kids **Death Star**—you get to wear the Black Hat **Pillbox**—simulated artillery fire **Calculator**—put your TRS-80 to work

November

End Zone—gridiron action game with everything except the cheerleaders **Troll's Gold**—a chase through a maze **Shopping List**—memory jogger listing items by category **Octal to Hex**—a must for the machine language programmer **Converting From Level I to Level II**—the how-to and why-for

December

Santa Paravia en Fiumaccio—16th century fuedal life simulation **Mortgage Calculation**—Figures interest, amortization, monthly payments **Six Million Dollar[/10K] Clock**—shows time, elapsed time, Greenwich Mean and serves as a chess clock **Spelling Bee**—quiz your kids better than Webster's **Biorythyms**—charts your personal intellectual, emotional and physical cycles based on date of birth

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