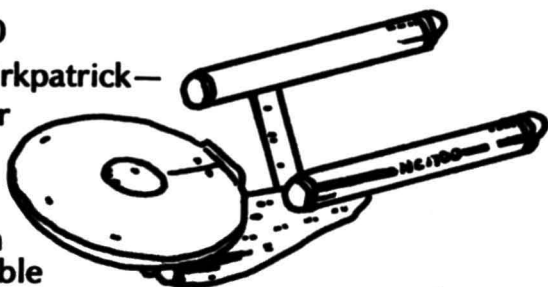# TRS-80 CRIBBAGE?

STARDATE: 2200

From Admiral Kirkpatrick—

"You are to enter and explore the Omega VI region of the galaxy, gather information on other inhabitable planetary systems that you may encounter and defend yourself should that situation arise."

You are in command of the Starship ENTERPRISE and its ships' 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 there is known to be astronomical hazards in the region such as pulsars, class 0 stars and black holes. The region is also patrolled by Klingon Battle Cruisers, so look before you leap.

SPECS: STAR TREK III

PLAY BOARD: 8 by 8 by 3 quadrants
WEAPON SYSTEMS: Phaser and Photon Torpedos
POWER SYSTEMS: Warp and Impulse
COMPUTER SYSTEMS: Science (Data Collection) and Ship's Computer
SENSORS: Long and Short Range
REPORTS: Damage Control and Status
PLAY ELEMENTS: 20 Klingon battle cruisers, 100+ stars and planets, black holes and pulsars.

2

0

TAROT

THE FOOL

Since the dawn of civilization man has sought a better explanation of the mysterious forces that seem to govern our lives. Learn the secrets of ancient Egypt. Benefit from the special knowledge once reserved for High Priests and Conquering Kings. Or better yet, if you don't believe in any of that, just bring it out the next time someone you know says, "Gee, it's a nice-looking computer. What does it do?"

SoftSide was conceived and born within four weeks of frantic activity, and this first issue is fraught with all the rough edges that any fledgling publication is heir to. Please be patient, it's our beginning.

There are those who might say we've got rocks in our heads for starting another computer magazine in the first place. We even wondered about it ourselves — but only for a minute.

Personal computing has taken a new direction. The technological wonder of the early '70's has come out of the basement workshop and into the living room. People are coming to look upon the computer less as the ultimate machine, the hobby in itself, and more as the tool, the medium, the vehicle for the real stars — our ideas and imagination.

Our intention is to publish software — and lots of it, free for the transcription. Every month we will offer programs for business, games, programs with household applications, even educational programs for children that will allow your home computer to become the educational aid we always knew it could be. Our content will be as diverse and unique as our featured program's writers.

It is our hope that SoftSide will be viewed not as just "another computer magazine", but as a different kind of magazine, the first dedicated to the most intriguing facet of computing today, that side which allows us to realize our expectations, our fantasies, our dreams.

Enter SoftSide — "your BASIC software magazine".

SoftSide™

CONTENTS

SoftSide Magazine is continually seeking original articles and Software for publication in our magazine. 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 prerecorded 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.

Inventory Management Software

INVENTORY FP-by M. Kelleher
This is a Front Panel approach to Inventory management. Available only for Level IImachines, it is for those who never want to type LIST. It handles up to 100 stock items with primary and backup vendor, and allows for stock on order anda date last shipment received information. The major difference between this system and the Modular system is that all information including character strings is contained in subscripts and are thus recordable separately from the program.

If your inventory exceeds 100 stock items, it should be a simple matter to segregate stock into logical subdivisions with separate data files. Two programs included on one cassette (Initialization & Maintenance).

Pictured at right,

INVENTORY FP

by M. Kelleher

```
INVENTORY FILE NAME? MICROPROCESSORS
QUANTITY IDENTIFIER? 125
(1)  SUPPLIER?
(2)  SUPPLIER? RADIO SHACK
DATE OF LAST SHIPMENT? 1-6-78
LAST PRICE PER UNIT? 399.95
*********************************
QUANTITY ON HAND? 10
QUANTITY SHIPPED? 5
QUANTITY RECIEVED? 15
*********************************
ADJUSTED INVENTORY BALANCE: 20
AT COST: 7999

IS THIS DATA ALL CORRECT? _
```

INVENTORY [MODULAR]
This inventory program runs on Level I or II TRS-80 Microcomputers. Its construction permits the user to create subroutines customized to his own purpose. One of the main features of this program allows for the inclusion of Alphabetic information and a Data Index Code in the form of data statements within the program. The result is performance and flexibility unmatched by our other Inventory Software. All versions include;

1. **Reports**-user specifies up to three numeric and either or both alpha informations to be listed and can be vendor specific
2. **Cost/value Summary**-searches all stock areas and reports Cost/value Quantity, Total Value by line item and Grand Total

3. **Reorder Search**-compares current stock level against specified reorder point and displays on screen all line items in need of reorder, along with tentative reorder information
4. **Index**-uses arbitrary file numbers reflecting the order in which the data codes are stored. Index will reveal the file names and file numbers in groups of 24 for use in other data calls.
5. **detailed rept**-every stock file is callable by file number to reveal all memory information regarding that item
6. **Read and Write File**-stores and reenters data from day to day
7. **Data Change**-updates Data Base

<center>Runs on Level I and II.
REQUIRES 16K (SPECIFY VERSION WHEN ORDERING)</center>

VERSION I 240 stock items can be contained using the full 8 data areas and two pieces of Alpha information
VERSION II 290 stock items can be contained using 6 data areas and two pieces of Alpha information.
VERSION III 450 stock items, Simplified report with no reorder search, allows one piece of Alpha information (description) and three data areas (quantity on hand, cost price, sales history)

INVENTORY SUPER PAC

This inventory program makes maximum use of available memory. It is especially useful in a real time 'amount on hand' environment, and will yield only the count. If your purposes require such features as automatic reordering and on line supplier information, we suggest that you look at one of the other inventory management programs. A good example of use would be a retail tire business where the ability to quickly determine the stock level of a certain type tire and to change it a sales occure and shipments arrive, is a necessity

VERSION I 1500 items stored in quantities of up to 999
VERSION II 2200 items stored in quantities of up to 99
VERSION III 6000 items stored in quantities of up to 9
VERSION IV 750 items stored in quantities of up to 99 and price information of up to four digits
    NOTE: Items are callable by code number. A seperate long is required to keep track of what the code calls represent.

SUMMARY
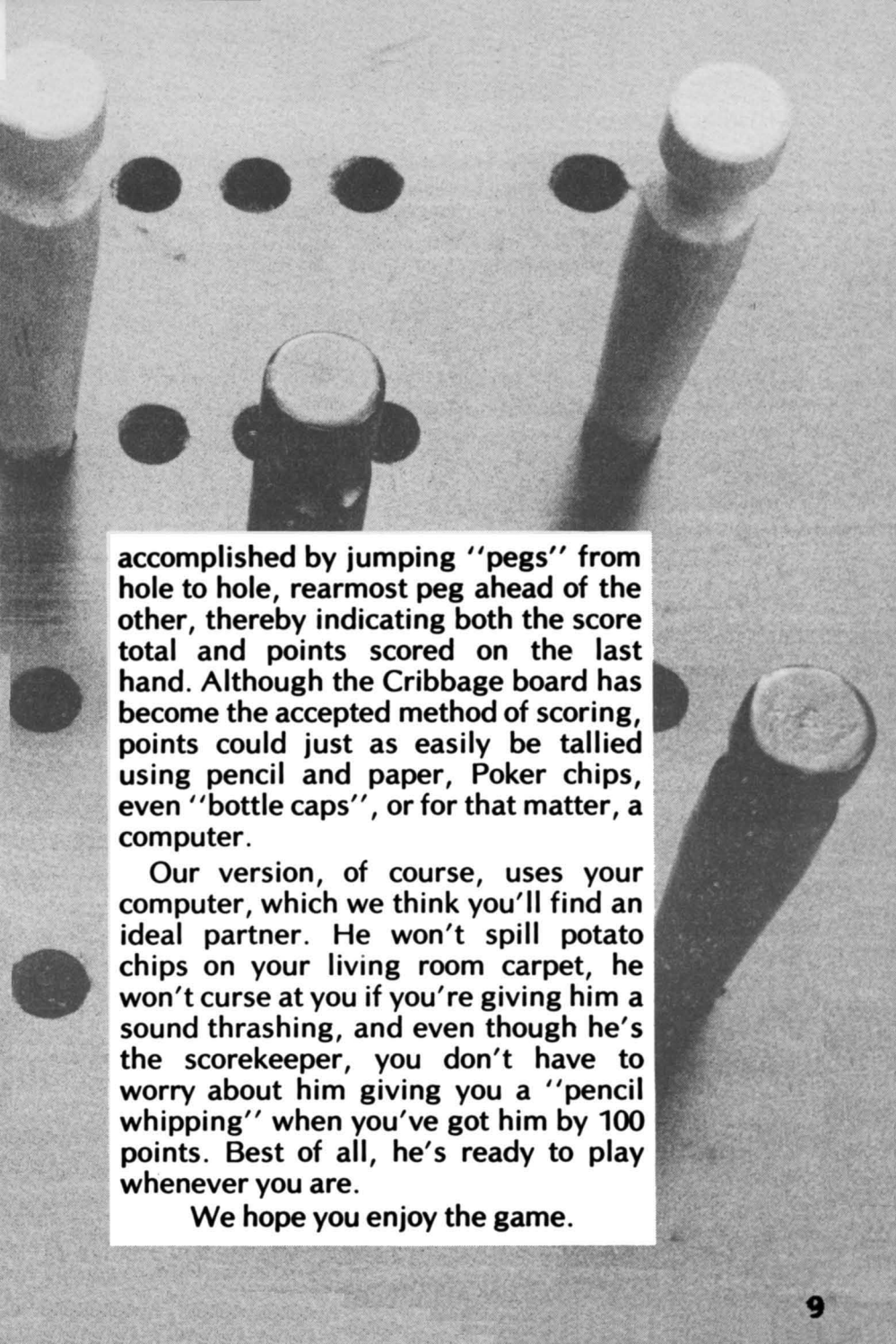
INVENTORY SUPER PAC	**LEVEL I**	**4K**	**$10**
INVENTORY MODULAR	**LEVEL I & II**	**16K**	**$20**
INVENTORY FP	**LEVEL II**	**16K**	**$25**

CRIBBAGE

The game of Cribbage may well be the most enduring card game since the invention of the 52-card deck.

Invented by British poet John Suckling back in the early 1600's, Cribbage, or as old John chose to spell it, "Cribbidge", would probably have become the most popular of all two handed card games were it not for the commonly held notion that the scoring device or Cribbage Board is indispensable, which it is not. The Game of Cribbage is based on an earlier card game called "Noddy", in which a similar scoring device was used. The game of Noddy has long since gone the way of the buffalo, leaving Cribbage the oldest surviving card game of its type.

The Cribbage board usually consists of a wooden board with 120 holes (60 for each player), plus a game hole for each player. Scoring, or "pegging", is

accomplished by jumping "pegs" from hole to hole, rearmost peg ahead of the other, thereby indicating both the score total and points scored on the last hand. Although the Cribbage board has become the accepted method of scoring, points could just as easily be tallied using pencil and paper, Poker chips, even "bottle caps", or for that matter, a computer.

Our version, of course, uses your computer, which we think you'll find an ideal partner. He won't spill potato chips on your living room carpet, he won't curse at you if you're giving him a sound thrashing, and even though he's the scorekeeper, you don't have to worry about him giving you a "pencil whipping" when you've got him by 100 points. Best of all, he's ready to play whenever you are.

We hope you enjoy the game.

ROUTINE:	INITIALIZATION
LINE:	5-100
PURPOSE:	Dimensioning, Q = analysis mode, Z = Kitty possession
PROCESS:	Cover Statements, Random seed

```
1 REM ******* SOFTSIDE PRESENTS *******
2 REM ** CRIBBAGE - YOU VS. COMPUTER **
3 REM *********************************
5 DIMA(219) CLS Q=0 Z=RND(2)
10 PRINT@530, "CRIBBAGE - YOU VS COMPUTER
11 PRINT@594, "COPYRIGHT 1978 - TRS-80 SOFTWARE EXCHANGE
12 PRINT@722, "ENTER ANY NUMBER LESS THAN 10000" INPUTA X=RND(A)
20 INPUT"DO YOU NEED INSTRUCTIONS (Y OR N)";A$ IF A$="Y"GOSUB9000
100 GOTO1006
```

CARD TYPE DECODER
101-113, 1380-1386
To determine and display card value (2 thru A)
1380 & 1382 decodes raw value (1 to 52) 1385 selects the
proper print line (101 thru 113)

```
101 PRINT@X-64, "A" :RETURN
102 PRINT@X-64, "2"; RETURN
103 PRINT@X-64, "3" : RETURN
104 PRINT@X-64, "4" : RETURN
105 PRINT@X-64, "5"; RETURN
106 PRINT@X-64, "6", RETURN
107 PRINT@X-64, "7", RETURN
108 PRINT@X-64, "8", RETURN
109 PRINT@X-64, "9"; :RETURN
110 PRINT@X-64, "10"; :RETURN
111 PRINT@X-64, "J", RETURN
112 PRINT@X-64, "Q", :RETURN
113 PRINT@X-64, "K"; RETURN
```

ROUTINE:	CARD SHUFFLER
LINE:	1006-1012
PURPOSE:	Generates 13 numbers from 1 to 52 randomly and checks to make sure there are no repeats. These are interpreted by the computer as the actual cards.
PROCESS:	1-13 = Clubs; 2 thru Ace sequentially
	14-26 = Diamonds; 2 thru Ace sequentially
	27-39 = Hearts; 2 thru Ace sequentially
	40-52 = Spades; 2 thru Ace sequentially

A(1) thru A(6) = Computer hand
A(7) thru A(12) = Player hand
A(13) = Cut Card
Line 1006-Working area cleared in Subscript
Line 1009-Analysis mode (Q) is set and Kitty pointer (Z) upcounted.
Line 1010-1012 - For 13 cycles (cards) a random number is generated and compared against other numbers already generated for duplication. If there is a duplication, it gets another random number without upcounting the FOR NEXT loop. End result; 13 random numbers from 1 to 52 placed in subscripst A(1) to A(13).
Line 1012-P(number of hands) and C(size of hand) are set for use in the ORDER UP routine.

```
1006 E=1:FORI=0TO10X.A(I)=0:NEXTI
1009 Q=0:Z=Z+1:IFZ>22Z=1
1010 FORI=1TO13
1011 A=RND(52):FORB=1TOI:IFA=A(B)GOTO1011
1012 NEXTB:A(I)=A:NEXTI:P=2:C=6
```

ROUTINE:	ORDER UP
LINE:	1210 - 1231
PURPOSE:	Each 6 card hand orders from the highest spade to the lowest club in that order.
PROCESS:	Line 1210 Initializes the routine. Described simply, the routine first seeks the highest card by comparing the first card against each of the others in the hand. If one is found to be higher, the two trade positions in the hand (subscripts). Once all six cards have been compared, and the highest card in the first position, the process is continued this time looking for, in effect, the second highest card, which will then wind up in the second lowest ordered position in the hand's string assignments. The extra stuff separates the computer's hand from the player's hand.

```
1210 D=C:I=1:B=2
1211 IFA(I)>A(B)GOTO1220
1212 A(0)=A(I):A(I)=A(B):A(B)=A(0):B=B+1:IFB<C+1GOTO1211
1213 GOTO1230
1220 B=B+1:IFB>CGOTO1230
1221 GOTO1211
1230 I=I+1:B=I+1:IFI<CGOTO1211
1231 C=C+D:IFI<(P*D)GOTO1230
```

ROUTINE:	RAW HAND DISPLAY CONTROL
LINE:	1300-1310

PURPOSE: Displays kitty ownership and sets the controlling variables for use in the card display subroutine. Prints needed heading statements, and declared ownership of the KITTY, depending on the indicating variable Z. Prints the overhead card #label for the raw six card hand. It also sets the 4 controlling variables for use in the CARD DISPLAY routine. The purpose of these variables are described here, and have the same purpose when used in the other display routines.

I = The starting position in the A(n) variable LESS 1
D = Total number to be displayed sequentially
X = Printing location (LESS 3) of where to start to display
B = Always 0. Controls progress when B = D display's complete.

```
1300 CLS:GOSUB1301:GOTO1401
1301 PRINT@330,"THIS IS YOUR HAND",:IFZ=1PRINT"IT IS YOUR KITTY
1302 IFZ=2PRINT"IT'S MY KITTY
1303 PRINT@525,"#1 #2 #3 #4 #5 #6
1310 I=D:B=0:X=650
```

ROUTINE: CARD DISPLAY
LINE: 1330-1386 & 101-113
PURPOSE: Provides a flexible routine usable by the various display routines for decoding and displaying the working number equivalents of the cards in a form recognizable to the user.
PROCESS: Each card is taken one at a time and divided by 13. The integer value (of 0 to 3) directs it to the proper suit (Hearts, etc.) display line (1360-1375). With the suit displayed at position X, the card's numeric value is placed in A, to be worked down to it's face value. Note: All 6's are in steps of 13. By subtracting increments of 13 from the working variable "A" until the remaining value is 13 or less, having thus been reduced to its face equivalent, line 1385 routes the program to the proper print command. The print location of the cards is directed over the suit by specifying location X-64, which is always the same column but one line higher on the screen.

```
1330 X=X+3:I=I+1:B=B+1::IFB>DRETURN
1345 IFA(I)=0GOTO1330
1348 ONINT(A(I)/13)GOTO1365,1370,1375
1360 PRINT@X,"CL";:GOTO1380
1365 PRINT@X,"DM";:GOTO1380
1370 PRINT@X,"HT",:GOTO1380
1375 PRINT@X,"SP";
1380 A=A(I)
```

```
1382 IFA>13A=A-13:GOTO1382
1385 ONXGOSUB102,103,104,105,106,107,108,109,110,111,112,113,101
1386 GOTO1330
1401 A(0)=0:PRINT@X+64,"FIX'IN MY HAND":GOTO2000
```

ROUTINE:	PLAY REPORT DISPLAY
LINE:	1500-1506
PURPOSE:	Responsible for preparing the report during the play phase of Cribbage. This display is refreshed after every play to show the new cards in play.
PROCESS:	Nothing special here; labels and card display parameters.

```
1500 CLS:PRINT@28,"PLAY REPORT
1501 PRINT"YOUR HAND","      CUT CARD"," ","DECK COUNT
1502 PRINT"   #1 #2 #3 #4":X=257:B=0:I=24:D=4:GOSUB1330
1503 B=0:D=1:I=12:X=215:GOSUB1330
1504 PRINT@244,V;:PRINT@328,"YOUR SCORE",A(14),"COMPUTER SCORE",A(15)
1505 PRINT@590,"PLAYED CARDS
1506 B=0:I=60:D=C:X=715:GOSUB1330:RETURN
```

ROUTINE:	COMPUTER HAND ANALYSIS CONTROL
LINE:	2000-2092 & 30000-30020
PURPOSE:	Prepares the various 4 card combinations from the computer's raw 6 card hand for meld value.
PROCESS:	Data lines carry the subscript address of the various hand combinations (15 in all). All six cards are then read and the last two are placed in the hold area for the "KITTY." The first four cards are assigned to working variables A,B,C, & D to assure that the originals are not disturbed. The results of the analysis are contained in the variables T & P. If the total is the highest so far, the hand is recorded and the process repeated until the four card hand with the highest value is determined.

```
2000 RESTORE:P=0:T=0:M=0
2001 FORL=1TO15:READA,B,C,D,J,K
2003 A=A(A),B=A(B),C=A(C):D=A(D)
2005 GOSUB2100:GOSUB2090:NEXTL:GOTO2600
2090 G=P+T:T=0:P=0:IFG<MRETURN
2091 I=150:A(I+4)=A(J):A(I+5)=A(K)
2092 I=150:A(I)=A:A(I+1)=B:A(I+2)=C:A(I+3)=D:M=G:RETURN
```

ROUTINE:	HAND ANALYSIS VARIABLE PREPARATION
LINE:	2100-2153
PURPOSE:	The raw card values (1 52) must be defined in three different ways. A second level or working variables (E,F,G & H), are prepared to be manipulated. as necessary. The first manipulation is to reduce the raw

numbers to their value equivalents so that all cards of the same value (Aces, Eights, etc.) can be identified as being the same.

PROCESS: The process is essentially the same as that used in the card display area. The raw value is stripped down in increments of 13 till it is equal to or less than 13. The differences arise as a result of having to store the results in the respective working variables. Line 2151 awards "Potential" value for the presence of any jack in the computer's hand.

```
2100 E=A:F=B:G=C:H=D:T=0:P=12/23
2115 I=E:GOSUB2150:E=I:I=F:GOSUB2150:F=I:I=G:GOSUB2150:G=I:I=H:GOSUB2150
2120 H=I:IFQ=1I=N:GOSUB2150:N=I
2125 GOTO2300
2150 IFI>13I=I-13:GOTO2150
2151 IFI=10P=P+12/46
2152 IFI<13I=I+1:RETURN
2153 I=1:RETURN
```

ROUTINE:	**PAIR DETECTION**
LINE:	2270-2275
PURPOSE:	Detects and scores to the holding variable T any pair combinations present in the hand under analysis.
PROCESS:	The scratch pad subscripts A(201) to A(213) are scanned for a value greater than 1. Such an indication reveals cards of the value (Pairs, Trips, etc.). See Scratch Pad routine for further information.

```
2270 FORI=201TO213:ONA(I)+1GOTO2272,2272,2273,2274,2275
2272 NEXTI:RETURN
2273 T=T+2:GOTO2272
2274 T=T+6:GOTO2272
2275 T=T+12:GOTO2272
```

ROUTINE:	**SCRATCH PAD PREPARATION**
LINE:	2300-2303
PURPOSE:	This area prepares a scratch pad area [A(201) thru A(214)] to be used to detect pairs and straights.
PROCESS:	Each of the working variables E thru H which contain numbers from 1 to 13 is added to the offset value 200 with the two added to produce a subscript address. A value of 1 is then added to the subscript contents.

A(201)	A(202)	A(203)	A(204)	A(205)	A(206)	A(207)
0	0	0	0	2	0	1
0	1	1	1	0	0	1
0	0	3	0	0	1	0

	A(208)	A(209)	A(210)
	1	0	0
	0	0	0
	0	0	0

Note that $A(214) = A(201)$. This places the Aces at each end of the scratch pad for determining straights.

```
2300 FORI=200TO214:A(I)=0:NEXTI
2301 A(E+200)=1:A(F+200)=A(F+200)+1:A(G+200)=A(G+200)+1
2302 A(H+200)=A(H+200)+1:IFQ=1THENA(N+200)=A(N+200)+1
2303 A(214)=A(201):IFQ<>2GOSUB2270
2304 IFQ<>0GOTO2350
```

ROUTINE:	STRAIGHT DETECTION (Computer Hand Selection)
LINE:	2305-2343
PURPOSE:	Each subscript is scanned in turn for a value higher than 0. Three of more consecutive subscripts in a row is scored as a straight. Failing this, potential value is awarded if two out of three subscripts register values greater than 0.
PROCESS:	Each subscript from 201 to 212 is checked in turn. If the subscript returns a 0 value, potential value is awarded by multiplying the factor of the number of cards in the deck which could fill that void (4) over the number of cards in not under analysis (46), by the contents of the next two subscripts (cards needed to possibly have a straight). Of course, if either subscript is 0, the resultant of the multiplication will likewise be 0, properly reflecting the potential of a straight with 1 or no cards present and only one cut card able to fill in the void. In other words, the approach used in this program to allow for the potential of the cut card filling voids in potential straights, is to replace the first void with the numeric equivalent of the probability of the cut card being the proper card times the presence of the third card. Without two out of three, resultant = zero.

```
2305 FORI=201TO212:IFA(I)>0GOTO2310
2306 P=P+(4/46*A(I+1)*A(I+2)*3):REM
2307 IFI<212NEXTI
2308 GOTO2400
2310 IFA(I+1)>0GOTO2320
2311 P=P+(A(I)*4/46*A(I+2)*3):REM AWARDS POTENTIAL
2312 GOTO2307
2320 IFA(I+2)>0GOTO2330
2321 P=P+(A(I)*A(I+1)*4/46*3):REM AWARDS POTENTIAL
2322 GOTO2307
2330 T=T+(3*(A(I)+A(I+1)+A(I+2)-2)):IFA(I+3)>0GOTO2340
```

```
2331 IFA(I)+A(I+1)+A(I+2)=4GOTO2335
2332 P=P+(12/46+3) GOTO2307
2335 P=P+(10/46)
2336 GOTO2342
2340 T=T+1 P=P+9/46
2342 IFI>209GOTO2400
2343 P=P+12/46 GOTO2400
```

ROUTINE:	**STRAIGHT DETECTION**	(Meld & Play Use)
LINE:	2350-2390	
PURPOSE:	This is a faster, more direct method of detecting straights without considering the potential value resulting from the cut card and is used in final meld determinations, and during play.	
PROCESS:	Essentially the same as the preceding area. If three consequetive areas in the subscripted scratch pad return positive values, straight points are applied to the holding variable "T". As is true with the rules of the game, if the total value of the three subscripts exceeds 3 then, a double (or quadruple) straight condition exists. If a three card straight condition exists, the fourth subscripts is checked for a positive value and an extra point awarded if the condition is true.	

```
2350 FORI=201TO212 IFA(I)=0GOTO2360
2351 IFA(I+1)=0GOTO2360
2352 IFA(I+2)=0GOTO2360
2353 IFA(I+3)>0GOTO2357
2354 IFA(I)+A(I+1)+A(I+2)=3T=T+3 GOTO2400
2355 IFA(I)+A(I+1)+A(I+2)=4T=T+6 GOTO2400
2356 IFA(I)+A(I+1)+A(I+2)=5T=T+12 GOTO2400
2357 IFA(I)+A(I+1)+A(I+2)+A(I+3)=4T=T+4 GOTO2390
2358 T=T+8 GOTO2400
2360 NEXTI
2390 IFA(I+4)>0T=T+1
2400 IFO=3RETURN
```

ROUTINE:	**VARIABLE PREPARATION STAGE 2**
LINE:	2410-2421
PURPOSE:	At this point, the working variables E thru H are converted to their play value. For play purposes in cribbage, Jacks, Queens, and Kings have a count value of 10 (so do the 10's). Aces have a count value of 1. So this area converts Jacks, Queens, and Kings to their count value of 10.
PROCESS:	Very straight forward: if the value in the current value of the variable is greater than 10, then it is made ten.

```
2410 I=E:GOSUB2420:E=I:I=F:GOSUB2420:F=I:I=G:GOSUB2420:G=I:I=H:GOSUB2420
2414 H=I:IFQ<>1GOTO2430
2416 I=N:GOSUB2420:N=I:GOTO2430
2420 IFI<11RETURN
2421 I=10:RETURN
```

```
2430 I=E+F:GOSUB2440:I=E+G:GOSUB2440:I=E+H:GOSUB2440:I=F+G:GOSUB2440:I=F+H
2431 GOSUB2440:I=G+H:GOSUB2440:I=E+F+G:GOSUB2440:I=E+F+H:GOSUB2440:I=F+G+H
2432 GOSUB2440:I=E+G+H:GOSUB2440:I=E+F+G+H:GOSUB2440
2433 I=E:GOSUB2440:I=F:GOSUB2440:I=G:GOSUB2440:I=H:GOSUB2440:GOTO2500
2440 IFI=15T=T+2
2441 IFI>15GOTO2446
2442 IFI<5GOTO2446
2443 IFI>5GOTO2445
2444 P=P+(16/46*2):GOTO2446
2445 P=P+(4/46*2):GOTO2446
2446 IFQ<>1RETURN
2447 IFU=1GOTO2449
2448 U=1:I=I+N:GOTO2440
2449 U=0:RETURN
2450 T=T+2:P=P-(2/26):RETURN
```

```
2500 ONINT(A/13)GOTO2530,2540,2549
2520 E=0:F=14:GOTO2550
2530 E=12:F=27:GOTO2550
```

```
2540 E=26:F=40:GOT02550
2549 E=39:F=53
2550 IF(B)E)*(B(F)*(C)E)*(C(F)*(D)E)*(D(F)GOT02556
2551 RETURN
2556 T=T+4:P=P+9/46:IFQ<>1RETURN
2557 IF(N)E)*(N(F)T=T+1:RETURN
2558 RETURN
```

ROUTINE:	**HAND REORDERING**
LINE:	2600-2615
PURPOSE:	At this point, the player is asked to make his final selection for his play hand by selecting the two cards which are to be placed in the KITTY. Once complete, this ends the hand selection phase of the hand, which is followed by this clean-up routine. This routine reassembles the cards in play into three four-card hands plus the cut card. After this routine is complete, the subscript assignments are:

COMPUTER HAND   A(1) - A(4)
PLAYER HAND   A(5) - A(8)
KITTY HAND   A(9) - A(12)
CUT CARD   A(13)

PROCESS:	2605 moves the player's discards to the KITTY hand [A(155) and A(154)] which already contains the computer's KITTY discards. 2605 zeros these Kitty selections out of the player's hand. 2607 moves the computer hand from the holding area [A(150) - A(153)] to it's play area [A(1) - A(4)]. 2608-2610 condenses the player's hand from A(7) - A(12) to A(5) to A(8). Finally, the KITTY hand is moved from A(154) - A(157) to A(9) - A(12). The cut card remains in A(13).

```
2600 INPUT"WHICH CARDS DO YOU WISH TO PUT INTO THE KITTY";A,B
2605 A(156)=A(A+6):A(157)=A(B+6)
2606 A(A+6)=0:A(B+6)=0
2607 FORA=1TO4:A(A)=A(A+149):NEXTA:REM COMPUTER HAND TO WORKING AREA
2608 B=5:FORA=7TO12:IFA(A)=0GOT02610
2609 A(B)=A(A):B=B+1
2610 NEXTA
2612 B=9:FORA=154TO157:A(B)=A(A):B=B+1:NEXTA:REM MOVES KITTY
2615 Q=1
```

ROUTINE:	**MELD DETERMINATION**
LINE:	2620-2632
PURPOSE:	It is at this time that the computer actually assesses the meld value of each of the hands. The actual posting to the player/computer point scores does not occur until after

the cards are played out. The reason for this is that there is a logical pause when the player will be assessing the significance of the cut card to his meld situation, and so the computer is put to work instead of waiting.

PROCESS: Q serves as a function switch in the main anaylsis area of 2100-2560, to allow for the inclusion of a fifth card (N) and avoid where practical, the assessment of potential value. The program then switches to the analysis area for a "True" meld value, with N representing the cut card. Each hand is dumped in turn into the E,F,G,H,N working variables and the actual value returned in T is stored in R,S, and W to be posted upon the completion of the hand.

```
2616 CLS:GOSUB2885:PRINT@600," "
2620 A=A(1):B=A(2):C=A(3):D=A(4):N=A(13):GOSUB2100
2621 R=T
2625 A=A(5):B=A(6):C=A(7):D=A(8):N=A(13):GOSUB2100
2626 S=T
2631 A=A(9):B=A(10):C=A(11):D=A(12):N=A(13):GOSUB2100
2632 W=T
```

ROUTINE: **MELD JACK VALUE**
LINE: 2633-2639
PURPOSE: The one point awarded to the holder of the Jack of the suit of the cut card is an exception because it is not available in the play (i.e., playing the Jack awards no special point). The routine detects the point and awards it to the proper meld holding variable.

PROCESS: Each card in the player, computer, and meld hands is checked to see if it is a Jack. If so, the suit is compared to the cut card A(13), and a point awarded if they match.

```
2633 FORI=1T012:X=A(I)
2634 IFX>13X=X-13:GOT02634
2635 IFX=10IFINT(A(I)/13)=INT(A(13)/13)GOT02637
2636 NEXTI:GOT02640
2637 IFI<5R=R+1:GOT02640
2638 IFI<9S=S+1:GOT02640
2639 W=W+1
```

ROUTINE: **PLAY TABLE PREPARATION**
LINE: 2640-2647
PURPOSE: During the play phase of a hand, the cards in deck must be defined in: their raw form (0-52), their count value (1-10) and their face value (A,2...K). Therefore, this routine defines each card in the computer and player hands [A(1) through A(8)] in all three ways elsewhere.

PROCESS: The raw value is read, processed to its generic or numeric equivalent, and stored in the proper locations in the table.

```
2640 FORA=1TO8:I=A(A):A(A+20)=I:NEXTA
2642 FORA=1TO8:I=A(A):GOSUB2150:A(A+30)=I:NEXTA.REM GENERIC VAL
2643 FORA=31TO38:I=A(A):GOSUB2420:A(A+10)=I:NEXTA:REM NUMERIC VAL
2645 C=0:N=0:FORI=50TO70:A(I)=0:NEXTI
2646 V=0:L=0:Y=0:K=0:J=0
2647 A(49)=0:A(50)=0
```

ROUTINE:	**CUT JACK VALUE**
LINE:	2648, 2980-2984
PURPOSE:	The rules of Cribbage specify that if the cut card itself is a Jack, the dealer is immediately awarded 2 points. It also marks the beginning of the play phase of the hand.
PROCESS:	The cut card A(13) is reduced to its type value to determine if it is a Jack. If so, 2 points are awarded immediately to the player or the computer [A(14) and A(15)] depending upon who is the dealer (Z).

```
2648 GOSUB2980
2650 ONZGOTO2700,2660
```

ROUTINE:	**PLAYER EXECUTION**
LINE:	2660-2683
PURPOSE:	It is in this area that the player cards are played, point situations detected and scored, and played cards erased from the play table and inserted into the play deck.
PROCESS:	A is your card selection. It must pass the test of not having already been used, and must not cause the count to exceed 31. Next comes the check for immediate score possibilities such as pairs, 15's, 31's, and straights. If you indicate a "GO", a "no play" situation, the computer does check your hand to verify that situation. If any points are posted, your card remaining indicator (K) is upcounted. The values representing your played card are entered into the play deck area and erased from the holding tables.

```
2660 INPUT"WHICH CARD DO YOU PLAY(0=GO)";A:IF(A>4)+(A<0:GOTO2661
2662 IFA=0GOTO2680
2663 A=A+44:IFA(A)+V>31GOTO2679
2664 IFA(A)=0GOTO2678
2665 T=0:V=V+A(A):IF(V=15)+(V=31)THENT=T+2
2667 GOSUB2685
2668 A=A-10:IFA(A)=A(C+50)T=T+2:IFA(A)=A(C+49)T=T+4:IFA(A)=A(C+48)T=T+6
2669 A=A+10:IFT0GOSUB2915
2670 C=C+1:A(C+50)=A(A-10):A(C+60)=A(A-20):A(A)=0:A(A-10)=0:A(A-20)=0
```

```
2671 K=K+1:IF(K)3)*(L)3)GOTO2674
2672 IFV=31GOTO2900
2673 J=0:GOTO2700
2674 IFV<31PRINT"PEG GO":GOSUB2770:GOTO3000
2675 PRINT"PEG 2":GOSUB2770:GOSUB2915:GOTO3000
2678 PRINT"THAT CARD HAS BEEN PLAYED ALREADY - TRY AGAIN":GOTO2668
2679 PRINT"PLAY DECK WOULD EXCEED 31, TRY AGAIN":GOTO2668
2680 FORI=45TO48:IF(A(I)<>0)*(A(I)+V<32)PRINT"YOU HAVE A VALID PLAY":GOTO2668
2681 NEXTI:IFJ=0J=1:GOTO2700
2682 IFV=31T=2:GOSUB2915:J=0:GOTO2900
2683 T=1:GOSUB2915:J=0:GOTO2900
```

ROUTINE:	IN PLAY STRAIGHT DETECTOR
LINE:	2685-2691
PURPOSE:	The conditions to award points for a straight during play are not quite the same as in a meld situation, in that the sequence in which they were played becomes more significant. Therefore, this area functions within those restrictions.
PROCESS:	First, the most recently played three cards are brought to the regular straight detector for checking. If it returns a positive value, the p rogram returns with the fourth and fifth card included.

```
2685 IFC=1RETURN
2686 O=T:T=0:Q=2:E=A(A-10):F=A(C+50):G=A(C+49):H=0:GOSUB2300
2687 IF(T)0)*(C)2)O=O+T:T=0:H=A(C+48):GOSUB2300:GOTO2689
2688 T=O+T:RETURN
2689 IF(T)3)*(C)3)O=O+1:T=0:Q=1:N=A(C+47):GOSUB2300:IFT)40=O+1
2690 IFT)0PRINT"SCORES";T;"ON STRAIGHT"
2691 T=0:RETURN
```

ROUTINE:	COMPUTER ALGORHYTHM
LINE:	2700-2728
PURPOSE:	As with any algorhythm, it provides the criteria by which the computer will arrive at its own decision regarding which card to play.
PROCESS:	Each card in the computer is compared against certain definable conditions, arbitrary values are assigned to the assessment subscript based on which condition exists. After each card has been checked, the computer plays the card with the highest rating. Impossible, and illegal situations are given impossibly high ratings to preclude their selection.

CHALLENGE

This algorhythm is constructed in such a way as to invite puttering. The point conditions are all covered, however, several definable subtlties and assessments of their significance can be changed or expanded to reflect the player's own approach, and values. There is still over 1000 bytes of memory unused for those who wish to hone their own decision-making command set. If you feel that you've come up with a really good one, send it out to us. We'll publish the best algorhythm received in a future issue.

```
2700 FORI=71TO74:A(I)=0:NEXTI
2705 FORI=41TO44:IF(A(I)=0)+(A(I-10)+V)31)A(I+30)=-10:NEXTI:GOTO2730
2706 IFA(I)+V=15THENA(I+30)=2
2707 IFA(I)+V=31THENA(I+30)=2.5
2708 IFA(I)+V=5THENA(I+30)=-1
2709 IFA(I)+V=10THENA(I+30)=-.3
2710 IFA(I)+V<5THENA(I+30)=.2
2711 IFA(I)+V>15THENA(I+30)=.2
2712 IFA(I)+V=21THENA(I+30)=-1
2715 A=I-10·0=I+30·IFA(A)=A(C+50)A(0)=A(0)+2:IFA(A)=A(C+49)A(0)=A(0)+4
2716 IFV+2*A(I))31THENA(0)=A(0)+.2
2717 IFC>1B=I:E=A(A):F=A(C+50):G=A(C+49):H=A(C+48):N=A(C+47):T=0
2718 IFC>10=2:GOSUB2300:I=B:IFT>0THENA(0)=A(0)+T
2719 IF((A(A)=A(C+50)+1)+(A(A)=A(C+50)-1))*((2*A(A))+V<32)A(0)=A(0)-.5
2720 FORB=31TO34:IFB=I-10NEXTB
2721 IF(A(B)=A(I-10))*(V+2*A(I)<32)THENA(I+30)=A(I+30)+.3
2728 NEXTI
```

ROUTINE:	COMPUTER EXECUTION
LINE:	2730-2770
PURPOSE:	Identical to player execution; official point detection and awards, moving cards to play deck and erasing them from the play table.
PROCESS:	Essentially the same as in player execution.

```
2730 A=-10:FORI=71TO74:IFA(I)>ATHENN=I:A=A(I)
2731 NEXTI.IFA=-10GOTO2760
2732 A=N-30:N=N-40:V=V+A(A)
2735 IFV=15PRINT"FIFTEEN FOR TWO":T=2:GOSUB2910
2736 IFV=31PRINT"THIRTY-ONE FOR TWO":T=2:GOSUB2910
2740 T=0:GOSUB2685:IFT>0GOSUB2910
```

```
2741 T=0
2742 IFA(N)=A(C+50)T=T+2 IFA(N)=A(C+49)T=T+4 IFA(N)=A(C+48)T=T+6
2745 IFT=2PRINT"PAIR FOR TWO" GOSUB2910 GOSUB2770
2746 IFT=6PRINT"TRIPS FOR SIX" GOSUB2910 GOSUB2770
2747 IFT=12PRINT"QUADS FOR TWELVE":GOSUB2910:GOSUB2770
2750 C=C+1 A(C+50)=A(N) A(C+60)=A(N-10) A(N)=0 A(A)=0 A(A-20)=0
2751 J=0:L=L+1:IF(L>3)*(K>3)GOTO3002
2752 CLS:IFV=31GOSUB2901
2753 GOSUB1500:PRINT@768," ":J=0 GOTO2660
2760 IFJ=1THENJ=0 GOTO2762
2761 J=1:GOSUB1500:PRINT@832,"COMPUTER GO":GOSUB2770 GOTO2660
2762 IFV=31GOTO2901
2763 T=1 GOSUB2910 GOTO2901
2770 FORO=1TO1000:NEXTO RETURN
```

ROUTINE:	**DISPLAY ROUTINE**
LINE:	2805-2806
PURPOSE:	Prepares the display to be presented to the player immediately after he has decided which cards to release to the kitty, as with the other display routines. It is accessed from line 2616.

```
2805 PRINT@320,"PLAYER HAND   #1 #2 #3 #4        CUT CARD"
2806 X=459 B=0:D=4 I=4 GOSUB1330:X=482 B=0 D=1 I=12 GOSUB1330:RETURN
```

ROUTINE:	**NEW DECK**
LINE:	2900-2905
PURPOSE:	Once both parties have issued a GO, it's time to clean up the play deck and zero the deck count variable.
PROCESS:	The deck count variable (V) is zeroed and the card values are erased from the holding areas [A(51) and A(61)] - C, which indexes the highest use in the deck holding area, is returned to start.

```
2900 FORI=51TO50+C A(I)=0 A(I+10)=0 NEXTI C=0:V=0:CLS GOTO2905
2901 FORI=51TO50+C A(I)=0 A(I+10)=0 NEXTI C=0 V=0 CLS
2902 PRINT@530,"NEW PLAY DECK":FORI=1TO999:NEXTI GOSUB1500:PRINT@900,
       " ":GOTO2660
2905 PRINT@530,"NEW PLAY DECK":FORI=1TO1000:NEXTI GOTO2700
```

ROUTINE:	**PLAY SCORING**
LINE:	2910-2916
PURPOSE:	All scoring which occurs during the play (as opposed to meld points) is officially posted to the proper holding variables.
PROCESS:	Entry at 2910 posts the value of T to the computer's game

score at A(15). Entry at 2915 posts the value of T to the player's game score at A(14).

```
2910 A(15)=A(15)+T:IFA(15)>120GOTO2950
2912 PRINT"COMPUTER SCORES";T:FORI=1TO1000:NEXTI:RETURN
2915 A(14)=A(14)+T:IFA(14)>120GOTO2960
2916 PRINT"PLAYER SCORES ";T:FORI=1TO1000:NEXTI:RETURN
```

ROUTINE:	GAME ENDING
LINE:	2650-2660
PURPOSE:	Throws a little zip into the game's ending and offers a replay.

```
2950 PRINT@532,"I WIN!!!!!!!!!!!!":PRINT@596,"I FEEL SO WOUNDERFULLLL!!
2955 PRINT:INPUT"SHALL WE GO AT IT AGAIN (1=YES)";A:IFA=1GOTO1006
2956 END
2960 CLS:PRINT@532,"PLAYED THIS GAME BEFORE? - YOU WIN!!":GOTO2955
```

Balance of CUT JACK VALUE ROUTINE see Line 2648.

```
2980 X=A(13):REM CHECK FOR CUT JACK
2981 IFX>13X=X-13:GOTO2981
2982 IFX<>10RETURN
2983 IFE=1PRINT"PLAYER CUTS JACK":T=2:GOSUB2915:RETURN
2984 PRINT"COMPUTER CUTS JACK":T=2:GOSUB2910:RETURN
```

ROUTINE:	END OF HAND DISPLAY/MELD SCORING
LINE:	3000-3038
PURPOSE:	This hand displays the entire hand, previous (before meld) and current point totals, as well as the meld point contributions of each hand. The program halts here until the player is satisfied that all is well.

```
3000 IFV=31A(14)=A(14)+2:GOTO3005
3001 A(14)=A(14)+1:GOTO3005
3002 IFV=31A(15)=A(15)+2:GOTO3005
3003 A(15)=A(15)+1
3005 GOSUB1505:FORI=1TO3000:NEXTI:CLS:ON2GOTO3020,3038
3010 FORI=1TO13:A(I)=RND(52):GOSUB2805:GOTO2600
3020 PRINT@8,"COMPUTER SCORE"," "," ","PLAYER SCORES":PRINT@69,A(15),
3021 PRINT@86,"CURRENT SCORES",:PRINT@117,A(14):A(15)=A(15)+R
3022 PRINT@133,R:PRINT@152,"MELD SCORE
3023 PRINT@181,S:PRINT@216,"KITTY SCORE",:PRINT@245,W
3024 A(14)=A(14)+S+W:PRINT@261,A(15),:PRINT@280,"NEW SCORES",
3025 PRINT@309,A(14)
```

```
3026 GOTO3036
3030 PRINT@0,"PLAYER SCORE"," "," ","COMPUTER SCORE":PRINT@69,A(14).
3031 PRINT@86,"CURRENT SCORES",:PRINT@117,A(15):A(14)=A(14)+5
3032 PRINT@133,S.PRINT@152,"MELD SCORE
3033 PRINT@181,R:PRINT@216,"KITTY SCORE",:PRINT@245,W
3034 A(15)=A(15)+R+W:PRINT@261,A(14),:PRINT@288,"NEW SCORES".
3035 PRINT@309,A(15)
3036 PRINT:PRINT"  YOUR HAND"," COMPUTER HAND","  KITTY HAND","CUT CARD
3037 X=511:D=4:I=4:B=0:GOSUB1330:X=527:D=4:I=0:B=0:GOSUB1330
3038 X=543:D=4:I=0:B=0:GOSUB1330:X=560:D=1:I=12:B=0:GOSUB1330:PRINT@047,"",
```

ROUTINE:	MELD GAME ENDING LOGIC
LINE:	3039-3041
PURPOSE:	By the end of the game, there should be no problem in determining if there is a winner, and if so, who it will be. However, when meld scores are added, there is the potential for both players to exceed the 120 points needed to win, and it is not necessarily the higher point total which wins. INstead, it is the side which melds first. (The side without control of the kitty scores first. Technically, the side with the kitty loses before having a chance to score his meld.)
PROCESS:	The two IF/THEN statements reflect those winning conditions logically (Z=kitty possession). Read in human language: "If my score is higher than 120 and you have the kitty, or if my score is higher than 120 and yours is not, I win."

```
3039 GOSUB10000.IF((A(14)>120)*(Z=2))+((A(14)>120)*(A(15)<120))GOTO2960
3040 IF((A(15)>120)*(Z=1))+((A(15)>120)*(A(14)<120))GOTO2950
3041 GOTO1009
9000 PRINT"CRIBBAGE DIRECTIONS
9001 PRINT"  HOPEFULLY YOU HAVE PLAYED CRIBBAGE SOME TIME BEFORE
9002 PRINT"IF NOT, THESE DIRECTION MAY PROVE INADEQUATE  IF SO, HOYLE'S
9003 PRINT"BOOK OF CARD GAMES SHOULD BE OF GREATER ASSISTANCE
9004 PRINT"   IN A NUTSHELL, CRIBBAGE JUST HAPPENS TO BE ONE OF THE BEST.
9005 PRINT"BEST TWO PLAYER CARD GAMES GOING (ALTHOUGH IT CAN BE PLAYED
9006 PRINT"BY MORE). TO START WITH, EACH PLAYER IS DEALT SIX CARDS
9007 PRINT"TO LOOK OVER  THE PLAYERS MUST THEN SELECT WHICH FOUR THEY
9008 PRINT"INTEND TO KEEP. THE OTHER TWO ARE PLACED IN THE KITTY.
9009 PRINT"THE CARDS PLACED IN THE KITTY WILL NOT BE PART OF THE
9010 PRINT"PLAY PHASE OF THE GAME, AND THE PLAYERS ALTERNATE
9011 PRINT"FOR POSSESSION OF THE 'KITTY' FOR THE MELD PHASE OF EACH
9012 PRINT"HAND. ":PRINT"":PRINT"":GOSUB10000
```

```
9020 PRINT"    THE BIGGEST CONSIDERATION IS TO SELECT THOSE CARDS WHICH
9021 PRINT"PRESERVE THE MAXIMUM MELD COMBINATIONS  THE FOLLOWING IS
9022 PRINT"A LIST OF THE VARIOUS MELD COMBINATIONS - REMEMBER, ANY
9023 PRINT"DIFFERING COMBINATION COMPOUNDS THE SCORING (EX, 2 5 5 & 2 10'S
9024 PRINT"PRODUCE 4 DIFFERENT 15 COMBINATIONS & TWO PAIRS FOR 12 PTS).
9025 PRINT"FIFTEEN'S",2,"FACE CARDS = 10 & ACE = 1
9026 PRINT"PAIRS",2;"3 OF KIND = 3 PAIRS
9027 PRINT"STRAIGHTS",3,"MINIMUM OF 3 CARDS ANY SUIT
9028 PRINT"FLUSH",4;"ALL FOUR CARDS IN HAND SAME SUIT
9029 PRINT"JACK",1,"IF IN SAME SUIT AS CUT CARD
9030 PRINT"REMEMBER, CARDS MAY BE USED AND REUSED IN ANY COMBINATION
9031 PRINT"AS LONG AS THE EXACT SAME CARDS ARE NOT BEING USED OVER
9032 PRINT"EX  6,7,8,9 OF HEARTS = STRAIGHTS 6-7-8-9 FIFTEENS 7-8,6-9
9033 PRINT"FLUSH 6-7-8-9  TOTAL PTS 12" GOSUB10000
9040 PRINT"    AFTER THE PLAYERS HAVE MADE THEIR SELECTIONS AND PRODUCED
9041 PRINT"THE 'KITTY', THE DECK IS CUT FOR THE COMMON CARD (CUT CARD)
9042 PRINT"THIS CARD IS INCLUDED AS PART OF EACH HAND DURING THE MELD
9043 PRINT"PHASE OF THE GAME. IF THE CUT CARD IS A JACK, THE DEALER
9044 PRINT"(WHOEVER HAS THE KITTY) IS AWARDED 2 PTS IMMEDIATELY.
9045 PRINT"    AFTER THE CUT CARD IS PRODUCED, THE PLAY PHASE BEGINS WITH
9046 PRINT"THE PLAYER WHO DOES NOT HAVE THE KITTY PLAYING THE FIRST CARD
9047 PRINT"    ALL COMBINATIONS THAT APPLY DURING THE MELD PHASE CAN
9048 PRINT"APPLY DURING THE PLAY PHASE, THE PRIME DIFFERENCE BEING
9049 PRINT"A GREATER ATTENTION TO THE ORDER IN WHICH THEY WERE PLAYED.
9050 PRINT"FOR INSTANCE, TWO POINTS ARE AWARDED TO THE PLAYER WHO PLACES
9051 PRINT"THE SECOND CARD OF A PAIR, HOWEVER, THEY MUST BE CONSECUTIVE
9052 PRINT"(LAST TWO CARDS PLAYED). THE SAME IS TRUE FOR
9053 PRINT"STRAIGHTS,  ETC.":GOSUB10000
9060 PRINT"    THIS PLAY OCCURS WHILE A COUNT IS BEING MADE OF THEIR COUNT
9061 PRINT"VALUE. THIS ASPECT OF CRIBBAGE IS SIMILAR TO BLACK JACK. THE
9062 PRINT"COUNT VALUES OF EACH CARD IS IDENTICAL TO BLACK JACK EXCEPT
9063 PRINT"THAT THE ACE IS ONLY ONE. AS THE PLAYERS ALTERNATE IN PLAYING
9064 PRINT"THEIR CARDS, THE COMBINED 'BLACK JACK' VALUE IS THE DECK
9065 PRINT"COUNT. THE MAXIMUM VALUE THE DECK MAY REACH IS 31  WHEN
9066 PRINT"THE PLAYER WHOSE TURN IT IS TO PLAY A CARD DOES NOT HAVE A
9067 PRINT"CARD LEFT THAT WOULD KEEP THE DECK VALUE UNDER 32, HE GIVES A
9068 PRINT"'GO'. THE OTHER PLAYER MUST THEN ATTEMPT TO ADD TO THE DECK
9069 PRINT"VALUE. IF HE CANNOT PLAY A CARD AND KEEP THE DECK VALUE UNDER
9070 PRINT"32, THEN THE LAST PLAYER TO PLAY A CARD IS IMMEDIATELY AWARDED
9071 PRINT"1PT. (2 IF THE DECK VALUE IS EXACTLY 31). THE DECK COUNT THEN
```

```
9072 PRINT"CYCLES BACK TO ZERO AND THE PLAYER WHO GAVE THE 'GO' PLACES
9073 PRINT"THE FIRST CARD OF THE NEW DECK.":GOSUB10000
9080 PRINT"   DURING THE PLAY, A PLAYER WHO PLAYS THE CARD THAT BRINGS THE
9081 PRINT"DECK COUNT TO EXACTLY 15 IS IMMEDIATELY AWARDED 2 POINTS.
9082 PRINT"   THE OBJECT OF THE GAME IS TO BE THE FIRST PLAYER TO GET A
9083 PRINT"SCORE OVER 120 PTS. REMEMBER, IT IS THE FIRST PLAYER TO REACH
9084 PRINT"A SCORE OF OVER 120, NOT THE ONE WHO PLAYS AFTER THE MELD HAS
9085 PRINT"BEEN ADDED, THAT WINS. THERE IS A SPECIFIC SEQUENCE TO
9086 PRINT"CREDIT POINTS. FIRST, THE CUT JACK IS AWARDED, THEN THE PLAY
9088 PRINT"POINTS ARE ADDED IMMEDIATELY AS THEY OCCUR, AND THEN THE MELD
9089 PRINT"POINT ARE ADDED, FIRST TO THE PLAYER WHO DOES NOT CONTROL THE
9090 PRINT"KITTY, THEN THE MELDS OF THE DEALER HAND AND KITTY HAND.
9091 PRINT"   IF THE NON KITTY PLAYER GETS OVER 120 FIRST, THE GAME ENDS
9092 PRINT"IMMEDIATELY. EVEN IF THE OTHER PLAYER WOULD HAVE HAD A HIGHER
9093 PRINT"SCORE IF THE GAME CONTINUED.":GOSUB10000
9100 CLS:PRINT@530,"GOOD LUCK!!!!!!!!":FORI=1TO1000:NEXTI:RETURN
10000 PRINT@916,"";:INPUT"PRESS ENTER";A$:CLS:RETURN
```

See Line 2000

```
30000 DATA1,2,3,4,5,6,1,2,3,5,4,6,1,2,3,6,4,5,1,2,4,5,3,6,1,2,4,6,3,5
30010 DATA1,3,4,5,2,6,1,3,4,6,2,5,1,4,5,6,2,3,1,2,5,6,3,4,1,3,5,6,2,4
30020 DATA2,3,4,5,1,6,2,3,4,6,1,5,2,3,5,6,1,4,2,4,5,6,1,3,3,4,5,6,1,2
```

Although it is our intention to publish programs in line listing form for our readers transcription, we realize that the actual keyboarding may require more time than some are able to devote.

To better serve our readers, prerecorded digital cassettes of this program are being made available for substantially reduced rates from the TRS-80 Software Exchange.

If the "prerecorded" route is best for you, simply check the appropriate box on the order form in the TRS-80 Software Exchange Market Basket section of this magazine.

STATE CAPITAL QUIZ

Quick,...
what's the capital of Montana?

Sure you know the answer. But how about freeing up some of that precious computer time for some knowledge-thirsty youngster? Educational organizations and far-seeing individuals have long praised the computer's potential as a teaching aid, so why not put your home computer to work right now.

It may not guarantee your student a Rhodes scholarship, but it could sure help his grade school geography!

This program is written for the TRS-80 Level II, but after some slight modifications will run just as well in a Level I machine.

```
10 PRINT"NAME THE STATES GAME"
100 C=RND(50).GOSUB910
104 CLS.FORN=1TO3.PRINT.NEXTN
105 PRINTB$," IS THE CAPITAL OF WHAT STATE?"
106 FORN=1TO3.PRINT.NEXTN.PRINT1,2,3,4
110 A=RND(4).ONAGOTO130,140,150,160
130 S=C.GOSUB900.PRINTA$,.GOSUB170.GOSUB170.GOSUB170
131 GOTO180
140 GOSUB170.S=C.GOSUB900.PRINTA$,.GOSUB170.GOSUB170.GOTO180
150 GOSUB170.GOSUB170:S=C.GOSUB900.PRINTA$,.GOSUB170.GOTO180
```

```
160 FORB=1TO3.GOSUB170.NEXTB.S=C.GOSUB900.PRINTA$.GOTO180
170 S=RND(50).IFS=CGOTO170
171 GOSUB900.PRINTA$, .RETURN
180 FORH=1TO3.PRINT.NEXTH.INPUT"WHAT IS YOUR ANSWER",B
190 IFA=BGOTO195
191 PRINT"WE WILL TRY THAT ONE AGAIN LATER"
194 FORT=1TO1000.NEXTT GOTO100
195 PRINT@922,"C O R R E C T  ! ! ! ".GOTO194
900 ONSGOTO1000,1010,1020,1030,1040,1050,1060,1070,1080,1090
901 ONS-10GOTO1100,1110,1120,1130,1140,1150,1160,1170,1180,1190
902 ONS-20GOTO1200,1210,1220,1230,1240,1250,1260,1270,1280,1290
903 ONS-30GOTO1300,1310,1320,1330,1340,1350,1360,1370,1380,1390
904 ONS-40GOTO1400,1410,1420,1430,1440,1450,1460,1470,1480,1490
910 ONCGOTO1005,1015,1025,1035,1045,1055,1065,1075,1085,1095
911 ONC-10GOTO1105,1115,1125,1135,1145,1155,1165,1175,1185,1195
912 ONC-20GOTO1205,1215,1225,1235,1245,1255,1265,1275,1285,1295
913 ONC-30GOTO1305,1315,1325,1335,1345,1355,1365,1375,1385,1395
914 ONC-40GOTO1405,1415,1425,1435,1445,1455,1465,1475,1485,1495
1000 A$="ALABAMA
1001 RETURN
1005 B$="MONTGOMERY
1006 RETURN
1010 A$="ALASKA
1011 RETURN
1015 B$="JUNEAU
1016 RETURN
1020 A$="ARIZONA
1021 RETURN
1025 B$="PHOENIX
1026 RETURN
1030 A$="ARKANSAS
1031 RETURN
1035 B$="LITTLE ROCK
1036 RETURN
1040 A$="CALIFORNIA
1041 RETURN
1045 B$="SACRAMENTO
1046 RETURN
1050 A$="COLORADO
1051 RETURN

1055 B$="DENVER
1056 RETURN
1060 A$="CONNECTICUT
1061 RETURN
1065 B$="HARTFORD
1066 RETURN
1070 A$="DELAWARE
1071 RETURN
1075 B$="DOVER
1076 RETURN
1080 A$="FLORIDA
1081 RETURN
1085 B$="TALLAHASSEE
1086 RETURN
1090 A$="GEORGIA
1091 RETURN
1095 B$="ATLANTA
1096 RETURN
1100 A$="HAWAII
1101 RETURN
1105 B$="HONOLULU
```

```
1106 RETURN                        1206 RETURN
1110 A$="IDAHO                     1210 A$="MICHIGAN
1111 RETURN                        1211 RETURN
1115 B$="BOISE                     1215 B$="LANSING
1116 RETURN                        1216 RETURN
1120 A$="ILLINOIS                  1220 A$="MINNESOTA
1121 RETURN                        1221 RETURN
1125 B$="SPRINGFIELD               1225 B$="ST. PAUL
1126 RETURN                        1226 RETURN
1130 A$="INDIANA                   1230 A$="MISSISSIPPI
1131 RETURN                        1231 RETURN
1135 B$="INDIANAPOLIS              1235 B$="JACKSON
1136 RETURN                        1236 RETURN
1140 A$="IOWA                      1240 A$="MISSOURI
1141 RETURN                        1241 RETURN
1145 B$="DES MOINES                1245 B$="JEFFERSON CITY
1146 RETURN                        1246 RETURN
1150 A$="KANSAS                    1250 A$="MONTANA
1151 RETURN                        1251 RETURN
1155 B$="TOPEKA                    1255 B$="HELENA
1156 RETURN                        1256 RETURN
1160 A$="KENTUCKY                  1260 A$="NEBRASKA
1161 RETURN                        1261 RETURN
1165 B$="FRANKFORT                 1265 B$="LINCOLN
1166 RETURN                        1266 RETURN
1170 A$="LOUISIANA                 1270 A$="NEVADA
1171 RETURN                        1271 RETURN
1175 B$="BATON ROUGE               1275 B$="CARSON CITY
1176 RETURN                        1276 RETURN
1180 A$="MAINE                     1280 A$="NEW HAMPSHIRE
1181 RETURN                        1281 RETURN
1185 B$="AUGUSTA                   1285 B$="CONCORD
1186 RETURN                        1286 RETURN
1190 A$="MARYLAND                  1290 A$="NEW JERSEY
1191 RETURN                        1291 RETURN
1195 B$="ANNAPOLIS                 1295 B$="TRENTON
1196 RETURN                        1296 RETURN
1200 A$="MASSACHUSETTS             1300 A$="NEW MEXICO
1201 RETURN                        1301 RETURN
1205 B$="BOSTON                    1305 B$="SANTA FE
```

```
1306 RETURN                      1416 RETURN
1310 A$="NEW YORK                1420 A$="UTAH
1311 RETURN                      1421 RETURN
1315 B$="ALBANY                  1425 B$="SALT LAKE CITY
1316 RETURN                      1426 RETURN
1320 A$="NORTH CAROLINA          1430 A$="VERMONT
1321 RETURN                      1431 RETURN
1325 B$="RALEIGH                 1435 B$="MONTPELIER
1326 RETURN                      1436 RETURN
1330 A$="NORTH DAKOTA            1440 A$="VIRGINIA
1331 RETURN                      1441 RETURN
1335 B$="BISMARCK                1445 B$="RICHMOND
1336 RETURN                      1446 RETURN
1340 A$="OHIO                    1450 A$="WASHINGTON
1341 RETURN                      1451 RETURN
1345 B$="COLUMBUS                1455 B$="OLYMPIA
1346 RETURN                      1456 RETURN
1350 A$="OKLAHOMA                1460 A$="WEST VIRGINIA
1351 RETURN                      1461 RETURN
1355 B$="OKLAHOMA CITY           1465 B$="CHARLESTON
1356 RETURN                      1466 RETURN
1360 A$="PENNSYLVANIA            1470 A$="WISCONSIN
1361 RETURN                      1471 RETURN
1365 B$="HARRISBURG              1475 B$="MADISON
1366 RETURN                      1476 RETURN
1370 A$="RHODE ISLAND            1480 A$="WYOMING
1371 RETURN                      1481 RETURN
1375 B$="PROVIDENCE              1485 B$="CHEYENNE
1376 RETURN                      1486 RETURN
1380 A$="SOUTH CAROLINA          1490 A$="OREGON
1381 RETURN                      1491 RETURN
1385 B$="COLOMBIA                1495 B$="SALEM
1386 RETURN                      1496 RETURN
1390 A$="SOUTH DAKOTA            1405 B$="NASHVILLE
1391 RETURN                      1406 RETURN
1395 B$="PIERRE                  1410 A$="TEXAS
1396 RETURN                      1411 RETURN
1400 A$="TENNESSEE               1415 B$="AUSTIN
1401 RETURN
```

PROJECT DEATH STAR

If you've seen the Movie, "Star Wars", you can't help but have come away from the theatre with a kind of "unearthly" love for Luke Skywalker and his friends — and why not? Heaven knows they're lovable enough. But what about the bad guys? In "Project Death Star", you get the opportunity to wear a Black hat. Your role in this simulation is on the side of the baddies, and your targets are none other than ..... well, enough said.

Entertainment value aside, the program utilizes a couple of TRS-80 programming tricks which we feel worth noting. The first trick really strikes at the heart of the program.

Remember that in Level I, the "CLEAR" command can act as an interrupt while in EXECUTE mode. Translated, this means that the Level I computer can clear your screen any time you press the "CLEAR" key — even if it is in the middle of doing something else, and then proceed with the program wherever it left off. So now you have an interrupt that can be given at any time. The only problem then, is how to take advantage of this real time ability.

The answer   lies in the use of SET, RESET and POINT statements. Take a close look at the text accompanying the "TRIGGER ACTIVATION" routine (lines 55, 305 and 210).

ROUTINE	INITIALIZATION
LINE:	1-55
PURPOSE:	Prepares game for running and sets up screen presentations, such as the initial placement of the batteries, the Federation fighters, etc. The Variables S (no. of shots) and F (no. of fighters destroyed), are initialized and the M is started at its refresh point of 10, causing an immediate refresh of the batteries and Death Star Display. "A$=" is used as a graphic constant. It is used in line 80 to draw the line that separates the report part of the display from the action area.

```
1 CLS.REM *** SOFTSIDE PRESENTS ***
2 PRINT@532, "DEATH STAR"
3 FOR I=1TO 1000.NEXT I
5 CLS
10 A$="================"
17 S=21.M=10.F=0
20 X=RND(600)+196
30 FORI=1TO13.A(I)=RND(832)+191.NEXTI
35 N=99
40 INPUT"DO YOU NEED INSTRUCTIONS (Y/N)",B
45 IFB<>99GOSUB1000
50 CLS
```

ROUTINE	TRIGGER ACTIVATION
LINE:	55,210,305
PURPOSE	Line 55 initializes the trigger detect point 0,0. Line 210 checks the presence of POINT (0,0) and if it is on, the program refreshes the screen and moves the fighters as usual. However, if it is not on, (if the CLEAR key has been struck), the target check subroutine is put to use. Line 305 refreshes the trigger (0,0).

```
55 SET(0,0)
```

ROUTINE	SCREEN REFRESH
LINE:	80 - 138
PURPOSE:	Speed is very much a factor in "Death Star". If you try to do too much within the display cycle, the game slows down to such a point that a win becomes trivial. So, screen refresh comes in three parts: the heading display, which is only refreshed after the player fires a salvo, the battery and star refresh, which occurs every tenth fighter cycle,

and the fighter cycle, which goes on constantly. Lines 80 & 85 constitute the heading display. They are activated during initialization and after a shot has been taken via line 310.

Lines 90 - 138 compose the battery star screen refresh. Line 90 assures a pass thru every tenth cycle.

```
80 PRINT@128, A$, A$, A$, A$
85 PRINT@64, "FIGHTERS DESTROYED", F, "SHOTS LEFT", S,
90 M=M+1. IFM<10GOTO139
92 M=0
95 PRINT@640, "+",
100 PRINT@704, "++",
110 PRINT@768, "+++",
120 PRINT@832, "++++",
130 PRINT@896, "+++++",
132 PRINT@960, "+++",
137 FORI=1TO10.PRINT@A(I), "+",
138 NEXTI
```

ROUTINE LINE:	FIGHTER CYCLE 139-217
PURPOSE	This is where the action takes place. The fighters are moved randomly and the new position is checked for validity. The previous fighter display is erased and a new display executed.
PROCESS:	Each fighter's position is called up sequentially and randomly modified in any of nine ways (including no change). Lines 200-208 mathematically represent the change in value needed to yield the PRINT location of each of the eight adjacent display positions.

```
139 FORI=11TO13.X=A(I)
140 A=RND(9).ONAGOTO200, 201, 202, 203, 204, 205, 206, 207, 208
200 T=X+65.GOTO209
201 T=X+64.GOTO209
202 T=X+63.GOTO209
203 T=X-1.GOTO209
204 T=X-65.GOTO209
205 T=X-64.GOTO209
206 T=X-63.GOTO209
207 T=X.GOTO209
```

```
208 T=X+1
209 IF(T<197)+(T>1020)GOTO140
210 IFFOINT(0,0)GOTO212
211 GOTO300
212 PRINT@X, " ", .X=T
213 IFI=11PRINT@X, "<0>", .GOTO217
214 IFI=12PRINT@X, "].^", .GOTO217
215 PRINT@X "-!-",
217 A(I)=X.NEXTI.GOTO090
300 FORI=1TO10.FORJ=11TO12.IFA(I)=A(J)+1GOTO400
301 NEXTJ.NEXTI
305 SET(0,0).S=S-1.IFS=0GOTO500
310 M=10.GOTO080
400 PRINT@10, "FEDERATION FIGHTER DESTROYED
410 PRINT@78, "THE EMPEROR WILL BE PLEASED",
420 FORL=1TO2000.NEXTL.F=F+1
430 PRINT@10. " ".GOTO201
500 CLS.IFF<3PRINT@524, "YOU ARE BEING SENT BACK TO GUNNERY SCHOOL.".END
510 IFF<3PRINT@524, "THE EMPEROR HAS DEMOTED YOU TO GUNNERY MATE 3RD".END
520 IFF<11PRINT@524, "GOOD SHOOTING. THE EMPEROR IS VERY PLEASED.".END
530 PRINT@524, "TERRIFIC. A PROMOTION AND BONUS IS ON THE WAY"..END
1000 CLS.PRINT@20, "DEATH STAR"
1010 PRINT"   A LONG TIME AGO IN A GALAXY FAR FAR AWAY, A SPACE STATION OF
1020 PRINT"AWESOME POWER WAS BUILT TO ENFORCE THE WHIMS OF AN EVIL RULER."
1030 PRINT"THIS STATION HAS THE POWER TO DESTROY WHOLE PLANETS.
1040 PRINT"   YOU ARE IN CHARGE OF THAT STATION'S  DEFENSE. YOU CONTROL"
1050 PRINT"THE REMOTE BATTERIES POSITIONED ABOUT THE STATION (SHOWN AS
1060 PRINT"'+'S). WHENEVER A FEDERATION FIGHTER'S MAIN BODY (CENTER CHAR-
1070 PRINT"ACTER) ENTERS THE SAME POSITION AS ONE OF YOUR BATTERIES.A FAST
1080 PRINT"TAP ON THE CLEAR KEY WILL ACTIVATE YOUR NEAREST BATTERY. YOUR
1090 PRINT"HIT IS THEN NOTED, AND THE GAME CONTINUES 'TILL ALL SHOTS ARE
1100 PRINT"EXPENDED, AND YOUR OVERALL PERFORMANCE IS SCORED.
1105 PRINT""
1110 INPUT"PRESS ENTER TO START", B$.RETURN
```

ROBOT!

TRS-80
PROGRAMMING HINTS

If you've ever been working on a program, and got stumped when trying to make it stop without requiring a numeric input to get it going again (for instance, at the end of a page of instruction), then this might be the line you've been looking for:

10#I. "PRESS ENTER TO CONTINUE";A$:RET.

The key feature here is the use of the character string A$ (as opposed to an A or B variable), which allows your TRS-80 to accept a "non-input" for a character string.

TRS-80
PROGRAMMING HINTS

There apparently is a problem in the Level II ROM from one of the suppliers. Under certain circumstances, programs including a READ data statement will malfunction. The effect is as if your program has a RESTORE command following each usage of the READ statement. THE CURE?

10 POKE 16553,255

BASIC STATISTICS

This powerful set of procedures is of use to students, instuctors, behavioral and research scientists, statisticians — anyone using these statistical formulas for practical or research applications:

\ RANK -ORDER DATA A simple program utilizing a Shell-Metzner sorting routine to rank data in an ascending manner.

CENTRAL TENDENCY Given a set of raw data, this program ranks and displays raw data (optional), N, X, X , variance, standard deviation, the Median, and the Mean.

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENT Given N pair (X,Y) of data, the program computes mean, standard deviation for S and Y, and R. An option is available to utilize a regression equation to predict Y given any value of X.

CHI-SQUARE Given raw data for any number of rows and column, the program will optionally display a raw data printout with observed and expected values; row, column, and grand totals; and gives the used CHI and DF.

FISHER T-TEST Given 2 sets of raw data for either equal or unequal N, the program computes and displays N, mean, standard deviation and standard error of the mean for both data samples as well as T and DF.

SIMPLE ANALYSIS OF VARIANCE Given raw data for any number of conditions, the program computes and displays N, Mean and Standard Deviation for each condition as well as SSbg, SSwg, SStot, DFbg, DFwg, DFtot, MSbg, MSwg, and the F.

Z-SCORES AND STANDARD SCORES Given N scores, the program computes a Z-score for each N. The user has an available option to compute a standard score for each N given the desired Population Mean and S.D.

RANDOM NUMBER GENERATOR Given the upper and lower limits, this program produces a list of N random numbers useful in research and experimental design.

NOTE: The basic formulas for these major statistical procedures were derived from the textbook, "Elementary Statistics", by Janet T. Spencer, Benton J. Underwood, Carl P. Duncan, and John W. Cotton. Appleton - Century - Crofts Psychology Series, New York, 1968.

Available on Digital Audio Cassette for the **Level II TRS-80** Microcomputer - $20.00

CALCULATOR

This simple program allows the TRS-80 to function as a calculator with 1 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 the reverse sign.

```
1 REM  **** SOFTSIDE PRESENTS ****
2 REM  **       CALCULATOR 1.1      **
5 Q=0.CLS
10 A=1.S=2.X=3.D=4.M=5.R=6.K=7.T=8
20 GOSUB300
25 PRINT"INITIAL VALUE", .INPUTQ
30 PRINT"FUNCTION", .INPUTF
35 IFF>4GOTO50
40 PRINT"ENTRY", .INPUTV
50 ONFGOSUB100,110,120,130,140,150,160,170
55 GOSUB300
60 PRINT"TOTAL",Q
70 IFF<>8GOTO30
80 FORI=1TO2000.NEXTI.GOTO5
100 Q=Q+V.RETURN
110 Q=Q-V.RETURN
120 Q=Q*V.RETURN
130 Q=Q/V.RETURN
140 N=V.RETURN
150 Q=1/Q.RETURN
160 Q=-Q.RETURN
170 Q=Q.RETURN
300 CLS.PRINT@0, "FUNCTIONS"
310 PRINT@64, "A =", "ADD", "S =", "SUBTRACT"
320 PRINT@128, "M =", "MULTIPLY", "D =", "DIVIDE"
330 PRINT@192, "M =", "MEMORY", "R =", "RECIPROCAL"
340 PRINT@256, "K =", "+/-", "T =", "TOTAL
345 PRINT@320, "N =", "RECALL MEMORY (AS AN ENTRY)
347 FORI=1TO60.PRINT"*", .NEXTI.PRINT""
350 RETURN
```

PILLBOX

Several versions of Pillbox have been published by Author Gene Perkins. This particular version, which awards a victory to the side which first scores hits on five of his opponent's placements, was prepared by the author at our request almost literally at the last minute.

The play of the game is deceptively simple. The computer draws the "battle ground", which consists of two gun placements separated by a forbidding mountain. Each player controls the angle of fire (0 through 90 degrees) and the muzzle velocity of the projectile. The configuration of the "Battlefield" is never the same, and your first shot or two usually winds up either hitting the mountain, or overshooting your opponent's pillbox.

The program runs on either Level I or Level II 4K TRS-80 microcomputer, and we think you'll find it's Fun/Keyboard Time Ratio quite satisfactory.

```
10 CLS:REM PILLBOX 2  BY GENE PERKINS
20 PRINT"TWO GUNNERS WILL TAKE TURNS TRYING
    TO HIT THE OTHER. "
30 PRINT"THE FIRST TO SCORE 5 HITS WINS THE
    'WAR'. "
40 INPUT"FIRST GUNNER'S NAME";A$
50 INPUT" 2ND  GUNNER'S NAME";B$
60 A(0)=0:A(1)=0:Z=4
100 CLS
130 D=RND(45)+8:E=42-RND(25)
140 F=RND(45)+72:G=42-RND(25)
150 FOR I=-2 TO 2:SET(D+I,E):SET(D+I,E+1)
160 SET(F+I,G):SET(F+I,G+1):NEXT I
170 M=RND(20)+8
180 IF M>E THEN M=E-2
190 IF M>G THEN M=G-2
200 FOR I=0 TO D+5:FOR J=E+2 TO 47
210 SET(I,J):NEXT J:NEXT I
220 FOR I=F-5 TO 127:FOR J=G+2 TO 47
230 SET(I,J):NEXT J:NEXT I
240 K=(M-E-2)/(57-D):L=E+2
250 FOR I=D+6 TO 63:L=L+K
260 FOR J=L TO 47:SET(I,J):NEXT J:NEXT I
270 K=(G+2-M)/(F-70):L=M
280 FOR I=64 TO F-6:L=L+K
290 FOR J=L TO 47:SET(I,J):NEXT J:NEXT I
300 P=RND(2)-1:GOSUB 800
310 K=P*32:L=P*96+64
320 PR. AT K, "BARREL ANGLE   MUZZLE VELOCITY"
330 PR. AT L, "";:INPUT A
340 IF (A<0)+(A>90) THEN 330
350 PR. AT L+20,;:INPUT V
360 IF (V<100)+(V>2000) THEN350
370 V=V*.056
380 A=A*.0174533
390 W=A*A*A
400 S=A-W/6+W*A*A/120-W*W*A/5040
410 A=1.5708-A
420 W=A*A*A
430 C=A-W/6+W*A*A/120-W*W*A/5040
```

```
440 Q=V*C:R=V*S
450 K=D:L=E:IF P=1 THEN Q=-Q:K=F:L=G
460 L=47-L:T=.05:B=0
500 T=T+.1:X=K+Q*T*2.3
510 IF (X<0)+(X>127) THEN 600
520 Y=47-(R-16*T)*T-L:IF Y<0 THEN 500
530 IF Y>47 THEN 600
540 B=B+2:A(B)=X:A(B+1)=Y
550 IF POINT(X,Y) THEN 600
560 SET(X,Y):GOTO 500
600 IFP=0 THEN 630
610 IF ABS(D-X)<Z THEN 700
620 P=0:GOTO 650
630 IF ABS(F-X)<Z THEN 700
640 P=1
650 FOR I=2 TO B STEP 2
660 RESET(A(I),A(I+1)):NEXT I
670 GOTO 310
700 A(P)=A(P)+1
710 GOSUB 800
720 FOR I=1 TO 100:SET(X+RND(11)-6,Y-RND(10))
730 RESET(X+RND(5)-3,Y-RND(5)+2):NEXT I
740 IF A(P)>4 THEN 760
750 FOR I=0 TO 1500:NEXT I:GOTO 100
755 P=1
760 FOR I=0 TO 200
770 PR. AT P*32+RND(13)*64+RND(18),
      "THE WINNER ! !";
780 NEXT I
790 GOTO 10
800 PR. AT 64,A$;"'S SCORE";A(0);
810 PR. AT 996,B$;"'S SCORE";A(1);:RETURN
```

43

TRS-80 PROGRAMMING HINTS

Here are three different ways to print a horizontal line across your TRS-80's screen. Each has its advantage in terms of flexibility and speed.

METHOD 1 - Easy on the programmer, fast to the screen, wasteful of memory and inflexible.

    10 P.''————————————————————————''

METHOD 2 - A little harder on the programmer, easier on the memory, fairly fast to the screen and can be very flexible.

    10 A$''————————————————————————15 P.AAA$

METHOD 3 - Requires more complex coding and control, but when the bytes count, it saves the most.

    10 F.I=1TO64:P.''—'';:N.I   (LEVEL I)
    10 FORI=1TO64:PRINT''—'';:NEXT I   (LEVEL II)

In regards to flexibility, consider this:

    10A$=****************
    15 GOS,100
    20 A$=++++++++++++++++
    25 GOS.100
    30 A$=:::():::():::()
    35 GOS.100:END
    100 P.A$,A$,A$,A$:RET

Small Business Accounting

```
RPT TO LAST WEEK
PURCHASES   33.71   ACCOUNTING  43.31   ADVERTISING  49.26
AUTO EXP    97.89   PACKAGING   58.82   CONTRIBU.    38.56
DELIVERY    36.65   ELECTRICITY 16.81   ENTERTAIN    63.65
FREIGHT     68.89   HEAT        87.75   INSURANCE    81.73
INTEREST    91.36   LAUNDRY     81.88   LEGAL        81.82
LICENSES    71.47   MISC EXP    68.82   OFFICE EXP   91.13
POSTAGE     88.86   RENT        89.12   REPAIRS      68.67
SHOP EXP    86.28   TX SOC SEC  87.63   TAX-STATE    11.18
TAX-OTHER   98.46   SELLING EXP 11.82   SUPPLIES     87.6
TELEPHONE   37.61   TRADE DUES  18.69   TRAVEL EX     8.28
WAGES&COM    2.98   SPEC#1      41.8    SPEC#2       92.79
SPEC#3      69.39   SPEC#4      41.93   NOTES PAYBL  28.58
FEDERAL INC 69.15   LOANS PAYBL 84.17   LOANS RECEV  48.55
PERSONAL    44.2    FIXED ASST  83.86   SPEC#5       98.84
TOTAL          2478.35      PRESS ENTER TO GO ON?_
```

This is a program designed to serve the small businessman with few employees. The process begins with the entering of last weeks reciepts. First load the tape file. A complete chart of all 42 expense areas will be on display as you enter your checking activity. after entering, you are given a review of your entries and allowed to change any incorrect data. The activity is then posted to their respective account areas. Reports for the year to date, year to last week, and this week are now available for review.

One of the special features of this program is that it gives the user the ability to customize account areas. If all, or some of the areas specified do not suit your business, or if other accounts would be more usefull to your particular business, the user can alter a few of the data statements, re-record, and everything will function as before. The process ends by transferring the newly created data file to cassette for use next week.

The program runs in Level I or II 16K, or Level I 4K. Sorry, but there just wasn't enough room in the Level II 4K to house the information. If you are using a Level I 4K, do not post more than 30 checks per batch.

This program was written to run in paralell with the nationally known 'Dome Bookkeeping System', and this journal is available for an additional $7.00 when ordering this program.

Available on digital cassette — $15.00, 22.00 with Journal.

Concentration

**Just like
the popular
TV Game Show!**

GAME BOARD

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

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

**Select a
square and
reveal one half of a fabulous prize.
Find the other half and it's yours (well,
not really). Stereos, televisions, Disneyland
trips, there all up there on the big screen -
there's even a TRS-80 !**

**But don't forget the basic rules,concentrate on whats on the board, or you'll end
up helping you opponent more than
yourself !**

**Available on digital cassette for the Level
I or II 16K TRS-80 Microcomputer—$7.95**

**The TRS-80 Software Exchange
17 Briar Cliff Drive
Milford, NH 03055**

In the next issue .....

END ZONE-Rough and tumble gridiron action as offens
and defense choose their strategy; run, keep
punt—the whole bit, and the computer works ou
the odds!

OCTAL TO HEXADECIMAL CONVERTER-A must for
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TRS-80 Software Exchange MARKET BASKET

PROGRAM DESCRIPTIONS

AUTOMATIC BASKETBALL by Roger Robitaille
An interesting use of GOSUB routines. It is loaded with various key player.
from the Boston Celtics and the Philadelphia 76's. The screen reports
activity much as a radio broadcasts games live.

RADIO SHACK MATHEMATICAL SUBROUTINES - by Radio Shack
All the subrouitnes for root, exponentiation, and the various trigonemetric
functions, as listed in Appendix B of the 'User's manuel' have been
keyboarded for your immediate use. Nothing creative here, just a time
saver for those who are using a Level I machine and need these
sub-routines. There is a built in test board to verify that they are functioning
correctly in the range you are planning to use them for. Written in Level i
(of course), it uses about 3K of memory. Those of you with with 4K
machines will be able to eliminate unneeded subroutines before proceeding
in earnest on your main program.

CARD GAME SUBROUTINES - by Roger W. Robitaille Sr.
This is a building block program which will shuffle a fifty-two card deck,
deal from 1 to 4 hands, of 1 to 13 cards (selectable), order them up by suit
and order and display them on the screen either one specific hand or all
together. Cycles time has been reduced from the original program by this
name to a maximum of a little under a minute. This program can be use as
is to generate random hands for bridge hobbiest etc.

BASIC STATISTICS - by Steve Reisser
This powerful set of procedures is of use to students, instructors, behavioral
and research scientist, 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.

PILLBOX - by Gene Perkins [featured]
This program simulates an altillery battle between two fixed implacements.
atwo player game, each player controls the angle of fire and the muzzle
velocity of the shell. The program places mountain between the warring
batteries and lets the laws of physics take over. A really good game fitting a
4K machines easily.

CONCENTRATION by Lance Micklus
Back in the sixty's, one of the most popular TV game shows in modern
history appeared on the air, entertaining millions for years. "Win campers
or boxes of nails, win gifts, but take the chance on forfeiting them later in
the game." Most of all, concentrate on where these items appear on the
play board. This program runs in 16K on either Level I or II ROM, and
assures hours of enjoyment—just like you used to!

BREAKAWAY-by Lance Micklus

A challenging "real time" action game of skill and dexterity. All the excitement of the traditional Pinball machine-without the expense! You control the speed and direction of the ball as you try to "Breakaway" the playing field. Easy to play? You bet! Easy to win? Better start practicing.

ZONE HOCKEY-by Michael Flanagan

A very interesting game with a graphics orientation. Designed for two players, the offensive player attempts to maneuver into zones close to the goal for a shot, while the defensive player attempts to anticipate those maneuvers. Score is kept and Periods accounted for by the numbers of keyboard plays entered. A very satisfying game for Level I 3.5K machines.

SMALL BUSINESS BOOKKEEPING-by Roger Robitaille

For scores of years, National Distributing Company has been selling the "Dome Bookkeeping Journal" through stationery and discount stores nationwide. Our Small Business Bookkeeping program is designed to be compatible with that bookkeeping journal.   As is appropriate with any business application, we assume no liability whatsoever in regards to the use of this program. 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 libility for its use (or misuse) is so staggering that you just plain use it at your own risk, or don't use it.

BANKO-by Lance Micklus

Banko is a game similar to Blackjack in principal; however, the game is not conducted in a simple "win/loss" manner. The maximum point is eleven, and the winner wins according to the point difference between the two players. Thus, the game is not over when one player "busts". It is for the other player to maximize his gains by increasing his count toward 11, without going over. Suitable for Level I or II 4K systems.

THREE D TIC TAC TOE

Everyone knows the game, but how about a 4x4x4 version. This program offers three skill levels for computer competition, and the author warns you to practice before you take on the computer's third skill level. You can also play your easy-to-beat friend, of course. LEVEL I & II 16K.

REMAINDER by Lance Micklus

A real good way to show off your TRS-80. It's a "find my number" game for people with 64K of head space. Warning: Dont leave this game loaded in your computer and walk away. Or, when you return, you'll find a crowd playing thes game. (Worse yet, they won't let you have your machine back.)

ROM TEST-by Radio Shack

This is the very same program listed in the back of the user's manual. If you want to avoid some keyboarding, here it is.

KLEON-by Roger Robitaille
A small but enjoyable galactic battle game where the good guys (yourself) face a bunch of enemy starships. You fire and get fired on. Records are kept of your success. It's a solitary game with appropriate graphics to guide the battle. Suitable for Level I 3.5K machines.

BLACK JACK-by Milan Chepko
Yes, I know you all have one, but if you are willing to forsake the graphics, many more of the Las Vegas type options are available with this Level I program.

TAROT CARDS-by Frank Rowlett
This is probably the best future gazing type program I have seen. Unlike many programs in the field, whose appeal wear out quickly, the combination of the graphics and the presenation leads to continuing use—try it, you'll like it.

BIORHYTHM-by James Penny
There is a theory that everyone is subject to a group of life cycles which, together, effect our daily life. The rates of those cycles are mathematically fixed and lend themselves to computer analysis. This program unravels those interrelated formulas into a meaningful graphic presentation. Runs in 4K Level I.

REVERSE
A computer favorite, you must put the digits 0 to 9 in ascending order by reversing a number sequence. Uses large numbers for display by making them with graphic characters. It also keeps score. For 4K Level I.

STAR TREK III by Lance Micklus
One of the most advanced Star Trek games ever written. Object is to explore as much of the galaxy as possible, destroy the 20 Klingons and locate the 5 class M planets. Thus, the exploration part of the Enterprise's mission has been added to the game, giving it a whole new dimension. Speaking of dimension, the galaxy is 3 dimensional, not flat like in other versions. Extensive use of graphics is made. During a Klingon battle, you will see the Enterprise fire its phasers, the phasers hit the Klingon and the Klingon explode. And before you go charging off, you must be careful of the large stars and black holes, as well as the pulsar. But there's more; the pulsar makes space noise in adjacent quadrants. The only way to find a Klingon in those quadrants is to explore them. And you never can tell in which one of them a Klingon might be hiding. Also, when you dock at a Star Base, you must control you speed. Otherwise, you'll have a collision but won't dock. At the end of the game, you return to Star Fleet Headquarters, where the data you've been gathering in your ship's computer will be evaluated and your performance rated. 16K Level II only. Takes about 2 hours to play a game.

TRS-80 SPACE WAR
TRS-80 Space War combines logic with luck into an exciting space simulation. Imagine yourself the captain of a Federation starship! Your

mission is to destroy three Klingon vessels which have invaded your space sector. A Klingon ship is hidden one of the 48 quadrants which comprise the sector. You may fire into a quadrant by entering the desired coordinates (coordinates are given on a sector map). If a Klingon is in your target quadrant, you will destroy him. If not, you will be given a "Trajectory Analysis" on which to base your next shot. Remember, the Klingons may fire at you at any moment! If they do, the odds are 1 to 4 that your ship will be destroyed. If your shields hold and the enemy's torpedo is deflected, the Klingon will immediately move to another quadrant.

KALEIDOSCOPE
This is a simple graphic program where the screen is put under the control of random subroutines which produce a four quadrant balanced pattern.

FIELD'S FANCY FACTORS by Mr. Field
This is an upgrade of our original "Prime Number Extractor". It analyzes each number sequentially and either declares the number to be a prime number or presents the factors composing the number. For those into mathematical application, this could be interesting.

TRS-80 LUNAR LANDER by S. W. Hebbler
In this version of Lunar Lander, you will attempt to land a Lunar Exploration Module on the surface of the moon under manual control. Short bursts of the retro rockets serve to slow down the descent of your disabled spacecraft. A safe landing is made if your velocity at impact is —10 feet/per/second or slower, a perfect landing if —2 feet/per/second or slower. The initial values for fuel available, speed of descent and distance from the lunar surface are set randomly at the beginning of each game. New values for these variables are displayed after each burn and the final values are given after your craft has been landed (or crashed!).

PILLBOX by Gene Perkins (featured)
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TREASURE HUNT by Lance Micklus

This is a challenge, so don't cheat and read the program listing. Use your imagination. You are exploring caves and trying to find 20 treasures. Some are easy to get, others are very difficult because you have to figure out how. When you first play, you will probably make a lot of mistakes. The more you play this game, the more secrets you will discover, and thus, 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. Your first problem is to draw a map of the caves. However, to save you time, a map is enclosed. Good luck, you're gonna need it.

MASTERMIND II-by Lance Micklus

Lots of people have written digital MASTERMIND programs that create the code and give you the clues. This one will also let you make the code and give the clues. You can play either way or take turns with the computer. 10 rounds make up a game, and at the end of each round, player averages are displayed. Because this is a machine language program, it takes the computer 3 seconds or less to come up with a guess. Both Levels I and II versions are supplied. Level I loads with the CLOAD command, and Level II with the SYSTEM command (file name MSTR). Loads into memory addresses 5000 to 7FF0 and thus requires 16K of memory.

MASTERMIND I-Same as above but written in BASIC for 4K machines. It only plays one way, the computer makes the code and gives the clues; you must break the code in 10 turns or less.

CHECKERS

A Level I machine with 4K of memory is all you need to have a checkers partner on call whenever you're in the mood. The program is written in BASIC, but is suprisingly fast and competitive for such a small program.

8080 TO Z-80 CONVERSION-by M. Kellher

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.

HANGMAN [Level I]-by Roger Robitaille

The age old pencil game has been tamed in Level I. For those who don't know the game, it is the original "guess my word in X number of tries" game. Originally in two versions, improvements have permitted this Program to play both a solitary and a two-player version. To be acceptable to Level I BASIC, the words must be coded in numeric equivalents, but the ever available conversion chart lessens the confusion. The displays are alphabetic.

HANGMAN [Level II]-by Russell Starkey

Essentially the same game, but this version takes advantage of the Level II capabilities and eliminates the need of coding your words and guesses. This version runs in the small TRS-80, but does not offer the solitary game (you versus computer).

DESCRIPTION	LEVEL	MEMORY	PRICE
GAMES			
Star Trek III	II	16K	14.95
Football	I & II	16K	7.95
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Concentration	I & II	16K	7.95
Hangman	II	4K	4.95
Hangman	I & II	4K	4.95
Three D Tic Tac Toe	I	16K	7.95
Checkers	I	4K	4.95
Mastermind I	I	4K	4.95
Mastermind II	I & II	16K	7.95
One Hockey	I	4K	4.95
Space War	I & II	4K	4.95
Xenon	I & II	4K	4.95
Pillbox (special)	I & II	4K	3.00
Kentucky Derby	I & II	4K	4.95
Lunar Lander	I	4k	4.95
Treasure Hunt	I & II	4K	7.95
Blackjack	I	4K	4.95
BUSINESS			
Cash Register	I & II	4K	10.00
Small Business Bookeeping	I & II	4K	15.00
same with journal			22.00
Inventory management (Super Pac)	I	4K	10.00
Inventory Management (Modular)	I & II	16K	20.00
Inventory Management (FP)	II	16K	25.00
SPECIAL PURPOSE			
Preflight	II	16K	20.00
Kaleidoscope	I	4K	4.95
ROM Test	I	4K	3.00
8080 — Z80 Conversion	II	16K	15.00
Basic Statistics	II	16K	20.00
Field's Fancy Factors	I	4K	5.00
Calculator (Featured)	I & II	4K	3.00
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PUZZLES			
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