****
IM-1 MILLION
IN A
****

ATTENTION ALL COMPUTER OWNERS BEWARE OF THE STATIC BUG CAUSE WHEN IT BITES THE COMPUTER DIES!

THIS IS A ROUGH WAY TO START OUR SECOND LETTER OF THE YEAR BUT IT IS THE SEASON TO WATCH OUT FOR '''STATIC'''. THIS CAN CAUSE AS MUCH DAMAGE AS LIGHTENING OR POWER SURGES. HERE ARE A FEW HINTS TO FOLLOW. THE FIRST IS THE BEST.

1. GET MORE HUMIDITY IN THE ROOM WHERE THE COMPUTER IS. THIS CAN BE DONE WITH AN INEXPENSIVE COLD AIR HUMIDIFIER. IT WOULD BE NICE TO DO THE WHOLE HOUSE IF POSSIBLE.
2. NEXT IS TO BE SURE AND TOUCH A METAL FRAME TO GET RID OF THE STATIC BEFORE YOU TOUCH THE MACHINE, ESPECIALLY BEFORE CHANGING THE GAME CARTRIDGES.
3. PUT THE MACHINE IN A ROOM WITH NO CARPET.

ANY OF THE ABOVE WILL BE BETTER THAN NOTHING. STATIC WILL PROBABLY BLOW YOUR BASIC CARTRIDGE AND THEY COST $99.95 RETAIL TO REPLACE. HOPE THIS KEEPS ANYBODY FROM DOING ANY DAMAGE TO THEIR MACHINE.

NOW THAT I HAVE YOUR ATTENTION ON WITH THE GOOD STUFF. IN THIS ISSUE WE ARE GOING TO TRY AND REPRINT ALL OF THE HARDWARE AND SOFTWARE PROBLEMS AND HINTS THAT HAVE BEEN IN THE OLD NEWS-LETTERS. THIS IS FOR ALL OF THE NEW PEOPLE OUT THERE. READ ON.

SO EVERYBODY WILL KNOW AND WON'T GET WORRIED ABOUT THEIR NEWSLETTER LET ME GIVE OUR TIMING FOR PRINTING AND MAILING. WE WILL HAVE A DEADLINE OF THE 20TH OF THE MONTH FOR ANYBODY THAT WANTS TO GET ANYTHING PUBLISHED. AROUND THE 23RD IS WHEN WE WANT TO HAVE OUR PROOF COPY AT THE PRINTERS AND IT TAKES THEM 2 TO 3 DAYS. WE WILL HAVE THEN ALL READY TO GO BY THE FIRST OF THE MONTH AND THEN WE START MAILING THEM. WE SEND BULK RATE SO THIS MEANS IT TAKES 7 TO 10 DAYS NORMALLY FOR DELIVERY. SO IF YOU HAVE NOT GOTTEN IT BY THE 15TH OF THE MONTH SOMETHING MIGHT BE WRONG. JUST DROP US A POST CARD AND ANOTHER ONE WILL BE SENT OUT THE NEXT DAY.

ALL OF THE OLD HINTS

1. DIM STATEMENTS. THE MANUALS SAY THE MAXIMUM IS 99 BUT IT IS ACTUALLY 999. EXAMPLE: DIM A(200),B(150,50),C(1,800) ARE GOOD. IT ALSO SAYS THAT DIM C$(99) IS THE MAX, BUT THIS IS NOT TRUE. YOU CAN USE A VALUE ABOVE 99 IN STRING VARIABLES BUT IT WILL CAUSE PROBLEMS WITH THE PRINT. EXAMPLE:

```
10 DIM C$(255)
20 PRINT C$(0);C$(55)
    ;C$(110);C$(165);
    C$(220)
```

THE REASON FOR BREAKING THE DIM DOWN LIKE THIS IS BECAUSE APPERANTLY THE MACHINE ONLY LOOKS AT THE LAST 2 DIGITS OF THE DIM SIZE TO DETERMINE THE MAX SIZE, SO YOU HAVE TO BREAK THE STRING DOWN INTO INCREMENTS EQUAL TO THE LAST 2 DIGITS.

2.EXPONENTIAL...IF YOU HAVE A FRACTION IT CAN CAUSE AN OVERFLOW OR A WRONG ANSWER. EXAMPLE::: X^Y IF X=1.ØØ1 AND Y=3 WILL CAUSE A WRONG ANSWER AND X=1.ØØ1 & Y=4 WILL CAUSE AN ARITHMETIC OVERFLOW. TO GET AROUND THIS YOU NEED TO JUST MULTIPLY X BY ITSELF Y TIMES.
3. TAB FUNCTION WHEN USED WITH STRING VARIABLES WILL NOT WORK PROPERLY IF THE STRING VARIABLE IS NOT FILLED WITH PRINTABLE CHARACTERS. THE BEST WAY AROUND THIS IS TO SET THE STRING TO SPACES BEFORE YOU PUT YOUR DATA IN IT. EXAMPLE C$=" "

4. FORMAT DEFINITION....IF YOU HAVE 'TEST', MIXED WITH A MASK DEFINITION (THE MASK IS THE # SYMBOLS), THERE MUST BE A SPACE BETWEEN THE LAST LETTER OF 'TEXT' AND THE FIRST # SYMBOL OF A MASK. EXAMPLE: 'FIRST #####' IS OK. 'FIRST#####' IS BAD. TEXT CAN FOLLOW DIRECTLY AFTER A MASK '#######FIRST'. MASK SIZE IS 8 INTERGER PLACES '#########.####'. YOU MUST HAVE ONE SPACE BETWEEN MASKS. '#### ####'
AFTER EXECUTING A 'PRINT USING' STATEMENT THE CURSOR ALWAYS IS PLACED AT THE BEGINNING OF THE NEXT LINE EVEN IF YOU PUT A ';' AT THE END. THIS CAN BE OVERCOME BY PUTTING ALL INFO IN ONE 'PRINT' STATEMENT.
WHEN PRINTING STRINGS IN A PRINT USING STATEMENT, SOME PROBLEMS OCCUR WHEN THE NUMBER OF NON NULL CHARACTERS OF THE STRING ARE LESS THAN THE MASK SIZE. EXAMPLE::

```
               10:####
               20 PRINT USING 10,"AB"
IT WILL PRINT    AB"
               20 PRINT USING 10,"AB     "
THIS WILL PRINT    AB
```

5. ORANGE SCREEN OR GARBAGE WHEN LOADING FROM TAPE CAN BE CAUSED BY TOO LONG OF A LEADER. TRY USING LEADERLESS TAPE OR WAIT 2 OR 3 SECONDS BEFORE HITTING RETURN.
YOU CAN ALSO TURN UP THE VOLUMN ON THE TAPE UNIT AND LISTEN FOR THE TONE AND THEN HIT 'RETURN'.

6. BUZZ FROM SPEAKER AFTER LOADING TAPE. USE A 'POKE 24578,54' IN THE FIRST LINE OF THE PROGRAM.

??

SEVERAL QUESTIONS FROM CHARLES CONSTANT

1. WHEN MACHINE FIRST TURNED ON THE SCREEN IS ORANGE WITH LIGHT BLUE CURSOR AND THE POKE 8193,6Ø DOES NOT APPEAR TO DO ANYTHING. !!!THE ORANGE SCREEN SOUNDS LIKE THE IM-1 IS OUT OF ADJUSTMENT. THIS IS WHAT IS PROBABLY EFFECTING YOUR POKE COMMAND ALSO.

2. ON PAGE 16 OF THE BASIC REFERENCE MANUAL THE CURSOR LOCATE PROGRAM WILL NOT WORK.

HERE IS A SIMPLE PROGRAM USING THAT ROUTINE::

```
  10 CALL 17046
  20 GOTO1ØØØ
 1ØØ A=L*32+P+512
 11Ø POKE 4Ø96Ø,INT(A/256)
 12Ø POKE 4Ø961,A-INT(A/256)*256
 13Ø RETURN
```

```
     1000 INPUT"ROW & COLUMN",L,P
     1010 GOSUB 100
     1015 CALL 17046
     1020 GOTO  1000
```
REMEMBER WITH THIS ROUTINE THE LINES ON THE SCREEN ARE NUMBERED Ø TO 15 AND THE COLUMNS ARE NUMBERED Ø TO 31.

4. WILL THE IM-1 SEARCH THE TAPE FOR DATA LIKE THE VIC-20? !!!SEE THE PROGRAM SECTION OF THE NEWSLETTER, THERE YOU WILL FIND A PROGRAM FROM THE TECH REF MANUAL WHICH A CHANGED TO ALLOW THE TAPE TO BE USED FOR DATA STORAGE. IT IS A SIMPLE PROGRAM WHICH EVERYBODY SHOULD BE ABLE TO ADAPT TO THEIR PROGRAMS.

5. CHARLES ALSO HAD PROBLEMS WITH SOME EXAMPLE PROGRAMS IN THE TECH REF MANUAL. THESE PROGRAMS WERE USED TO STORE FRONT SCREEN PICTURES ON TAPE. I HAVE KEYED IN ALL OF THEM AND CANNOT FIND ANY PROBLEMS WITH THEM. BELOW IS A LISTING OF THEM FOR THE OTHER MEMBERS.

```
10 CU=0: GOSUB 500: REM MOVE CURSOR TO 0
20 FOR I=1 TO 16: PRINT SPC(32);: NEXT I: REM ALL GREEN SCREEN
30 CU=256: GOSUB 500
40 PRINT SPC(9);"THIS IS A TEST"
50 FOR I=0 TO 31: POKE I,191:NEXT I:REM LINE OF RED SQUARES
60 FOR I=478 TO 511: POKEI,255:NEXT I:REM LINE OF ORANGE SQUARES
70 CU=512: GOSUB 500: REM MOVE CURSOR BACK TO SCREEN
80 END
500 POKE 40960, INT(CU/256):POKE 40961,CU-(INT(CU/256)*256)
510 RETURN
```
'RUN' THE PROGRAM AND IT WILL BUILD A FRONT SCREEN IN MEMORY AT Ø TO 511. THEN 'POKE 41452,255' TO CHANGE FRONT SCREEN FLAG. DO 'CSAVE' THEN DO A 'CLOAD'.

THE NEXT 2 PROGRAMS ARE USED TO BUILD FRONT SCREENS ON TAPE THEN LOAD THEM WHILE RUNNING A PROGRAM.

```
10 CALL 17046: REM CLEAR SCREEN
20 SHAPE=15: REM CREATE SCREEN THAT IS COLORED HLIN
30 FOR I=0 TO 15
40 COLOR=I: HLIN 0,31,I:NEXT I
50 GOSUB 500: REM GOTO ROUTINE TO SAVE SCREEN
70 CALL 17046: REM CLEAR SCREEN
80 FOR I=0 TO 31: REM CREATE SCREEN THAT IS COLORED VLIN
90 COLOR=I:VLIN 0,15,I:NEXT I
100 GOSUB 500
110 END
500 POKE 41446,164: POKE41447,1: REM CHANGE END OF MEMORY
   POINTER TOO 41985(HEX A401)
510 CALL 34040: CALL 34138: CALL 34061: REM MOTOR ON, SAVE, OFF
520 POKE 41446,191: POKE 41447,255: REM CORRECT END OF MEMORY
530 RETURN
```
ENTER THE PROGRAM, PLACE TAPE IN AND PRESS PLAY. RUN THE PROGRAM AND IT WILL SAVE 2 SCREENS ON TAPE AND STOP.
THE SECOND PART OF THE PROGRAM WILL LOAD THE SCREEN BACK IN.

```
10 GOSUB 500: REM GOTO ROUTINE TO READ FIRST SCREEN
20 POKE 40960,0:INPUT R:REM MOVE CURSOR & WAIT FOR 'RETURN'
30 GOSUB 500: REM GO READ SECOND SCREEN
40 END
500 POKE 41446,164: POKE 41447,1:REM CHANGE END OF MEM POINTER
510 A=PEEK(41984):B=PEEK(41985):REM SAVE TRUE END OF PROGRAM
520 CALL 34040:CALL 34225: CALL 34061:REM READ TAPE
530 POKE 41446,191:POKE 41447,255:REM CHANGE MEMORY END POINTER
540 POKE 41984,A:POKE 41985,B:REM CHANGE END PROG POINTER
550 RETURN
```

AFTER ENTERING THE PROGRAM PUT TAPE IN UNIT AND 'RUN'. IT WILL LOAD FIRST SCREEN THEN WAIT FOR 'RETURN' TO LOAD SECOND SCREEN. I HAVE PRINTED THESE PROGRAMS TO ALLOW OTHER MEMBERS THAT DON'T HAVE THE TECH REF MANUAL TO GET THE USE OF THE PROGRAMS ALSO.

!!

MACHINE PROBLEMS SENT IN BY J H RANDALL

I RECEIVED THE FIRST ISSUE OF THE NEWSLETTER AND AM PLEASED WITH ITS CONTENTS AND WHAT IS PROPOSED FOR COMMING ISSUES. ALSO THERE IS THIS PROBLEM I HAVE RUN ACROSS (AND MAYBE OTHERS HAVE, TOO). I WAS TRYING THIS:

```
10 INPUT X
20 IF X=0 THEN PRINT "ZERO":STOP
30 PRINT X, X*X,X/X,X^X
```

WHEN X=100 THE COMPUTER PRINTED 100 10000 1 1
WITH X=10 THERE WAS AN LINE 30 ARITHMETIC OVERFLOW, WHY???
ALSO WITH X=9.3 -520411082.7048 WAS PRINTED
X=9.4 -572992801.8459 WAS PRINTED

ALL OF THE ERRORS SHOW HERE IN THIS PROGRAM GOES WITH THE PROB-LEM EXPLAINED EARLIER IN THE LETTER WITH THE EXPONITIAL. THE MACHINE WILL NOT RAISE FRACTION NUMBERS PROPERLY AND IF THE NUMBER YOU ARE RAISING IT TO IS MORE THAN 2 DIGITS IT WILL ONLY USE 2. EXAMPLE: 100^102 WILL BE THE SAME AS 100^2.
IT SEEMS LIKE IT WOULD BE BEST TO PROGRAM AROUND THE EXPONETIAL FUNCTION WITH A 'FOR' LOOP.

INCIDENTALLY, HOW DID YOU INCREASE THE LINE WIDTH ON THE APF TO DO THE NEWSLETTER??

!!!!RIGHT NOW WE ARE USING A LINE PROCESSER PROGRAM THAT WE PURCHASED FROM ONE OF THE CLUB MEMBERS GLEN R JONES, TULSA, OKLA AND IT SETS UP THE LINE WIDTH OF 64 CHARACTERS FOR US. IF YOU WANT MORE INFO SEE THE WANT ADS FOR HIS ADDRESS AND YOU CAN SEND FOR MORE INFO.

??

QUESTION FROM TOM DONAHUE

I WOULD LIKE TO SEE SOME DATA PROGRAMS AND SOME INFORMATION ON HOW TO USE THE IM-1 TO MAKE A PROGRAM WITH THE 'READ' & 'DATA' STATEMENTS.

!!!RIGHT NOW I DON'T HAVE ANY PROGRAMS BUT HERE IS A SIMPLE ONE TO SHOW HOW TO USE THE STATMENTS.

```
10 DIM A$(12,10)
20 FOR I=1 TO 12
30 READ A$(I,1)
40 NEXT I
50 FOR I=1 TO 12:PRINT A$(I,1):NEXT I
60 END
100 DATA JANUARY,FEBRUARY,MARCH,APRIL,MAY,JUNE,JULY,AUGUST
110 DATA SEPTEMBER,OCTOBER,NOVEMBER,DECEMBER
```

BASIC BOX BASIC BOX BASIC BOX

OK HERE WE GO THE STATEMENT OF THE MONTH WILL BE THE 'DIM'.....
THE WAY THE BOOKS TALK ABOUT IT IS EVEN HARD FOR SOMEBODY WHO
HAS BEEN PROGRAMMING FOR YEARS TO UNDERSTAND.

THE 'DIM' STATEMENT IS USED TO RESERVE PART OF MEMORY FOR THE
PROGRAMMER TO STORE DATA IN, WHEATHER IT IS NUMERIC DATA OR
ALPHA/NUMERIC (REFERED TO AS STRINGS). FIRST OFF YOU HAVE TO
UNDERSTAND THAT THERE IS A BIG DIFFERANCE BETWEEN 'DIM' FOR JUST
NUMERIC OR 'DIM' FOR STRINGS. WHEN THE 'DIM' IS USED FOR NUMERIC
DATA IT RESERVES ENOUGH MEMORY FOR EACH LOCATION IN THE 'DIM' TO
HOLD A MAX NUMERIC VALUE OF 999999999.9999. THE STRING
'DIM' HOLDS 1 CHARACTER IN EACH LOCATION.

EXAMPLE DIM A(3) WITH THIS YOU CAN STORE 4 NUMBERS WITH A
MAX VALUE OF 999999999.9999 IN EACH A(Ø), A(1), A(2), A(3)
EXAMPLE: DIM A(3,3) THIS WILL ALLOW YOU TO STORE 16 NUMERIC
VALUES AT A(Ø,Ø), A(Ø,1), A(Ø,2), A(Ø,3), A(1,Ø).....ETC.....
TO HOLD A MAX VALUE OF 999999999.9999 EACH.....

HERE COMES THE CONFUSION FOR EVERYBODY THE STRING...
I THINK THE BEST WAY IS WITH EXAMPLES.
NOTE THE $ DENOTES THAT IT IS A 'DIM' FOR A STRING VARIABLE.
#1.. DIM A$(1Ø) WITH THIS YOU ARE ALLOWED TO STORE 11
CHARACTERS ONLY. A$(Ø)="ABCDEFG1234" WOULD BE THE SAME AS THIS
A$(Ø)="A", A$(1)="B", A$(2)="C",.....A$(1Ø)="4"
#2.. DIM A$(2,3) WITH THIS YOU CAN STORE A TOTAL OF 9
CHARACTERS. IF A$(Ø,1)="123" & A$(1,1)="ABC" & A$(2,1)="XYZ"
THEN A$(2,3)="Z" & A$(1,2)="B" & A$(Ø,1="1", ETC

YOU WILL NOTE THAT IN EXAMPLE #2 FOR STRINGS THAT YOU CANNOT
SELECT THE FOLLOWING A$(Ø,Ø) & A$(1,Ø) & A$(2,Ø) THIS IS JUST
A RESTRICTION IN THE 'BASIC INTERPRETER'.....

HEY I THINK I STRAINED SOMETHING!!

```
0  REM    THIS PROGRAM WILL SHOW YOU HOW TO USE YOUR TAPE AS A TRUE DATA STORAGE SYSTEM.
1 A= PEEK (41009):B= PEEK (41010): REM    THIS LINE SAVES THE VARIALBE STORAGE POINTER
2  POKE 41009,0: POKE 41010,0: REM    THIS LINE SETS THE VARIABLE STORAGE POINTERS TO POINT TO ADDRESS  0000
3  DIM Z$(255): POKE 41009,A: POKE 41010,B: REM    THIS LINE WILL SET UP THE OUTPUT DIM AND THEN RESET VARIABLE STORAGE POINTERS TO
ORGINAL VALUE
10  DIM SP$(31)
15  PRINT "PLACE TAPE IN DECK AND PRESS    PLAY (BE SURE TAPE IS POSITIONEDPROPERLY, IT WOULD BE BEST TO USE LEADERLESS TAPE)"
20  FOR J=1 TO 3: REM    HIS SETS UP A LOOP TO ALLOW 3 BLOCKS TO BE WRITTEN ON TAPE
25 Z$="                                                                                                                          "
26 SP$="                                  ": REM    THIS IS USED TO CLEAR BUFFER TO SPACES RATHER THAN NULLS
30  FOR I=0 TO 255 STEP 32:Z$(I)=SP$: INPUT Z$(I): NEXT I
31  REM    LINE 30 WILL BE THE INPUT ROUTINE. IT IS SET UP TO HAVE 8 32 CHARACTER LINES IN EACH BLOCK.
35  GOSUB 200: REM    HERE WE GO TO SET UP LOW, HIGH, AND MEM END POINTERS
40  CALL 34141: CALL 34061: REM    HERE WE OUTPUT TO TAPE AND THEN TURN OFF MOTOR
50  GOSUB 300: REM   GO RESET THE MEM END POINTER.
60  NEXT J
70  INPUT "REWIND TAPE, PRESS PLAY, THEN   RETURN KEY",K
80  FOR J=1 TO 3: REM    SET UP LOOP TO READ 3 BLOCKS OFF TAPE
90  GOSUB 200: REM    GO SET UP LOW, HIGH AND MEM END
100  CALL 34220: CALL 34061: REM    READ TAPE AND THEN STOP MOTOR
```

CALL BOX CALL BOX CALL BOX

TO START WITH THIS TIME I NEED TO TRY AND EXPLAIN THE FUNCTION OF THE 'CALL' STATEMENT TO THE NEW MEMBERS. THE 'CALL' STATEMENT IS USED BY THE 'BASIC' PROGRAM TO EXECUTE MACHINE LANGUAGE PROGRAMS WHICH CAN BE WRITTEN BY THE PROGRAMMER OR BE PART OF THE 'BASIC INTERPRETER' OF THE MACHINE. THIS ALLOWS THE PROGRAM TO EXECUTE SOME THINGS FASTER THAN WHAT THE INTERPRETER WILL ALLOW AND ALSO DO SOME THINGS WHICH THE INTERPRETER WILL NOT DO AT ALL.

NUMBER 1 FOR TODAY IS A METHOD TO TURN OFF THE DISC MOTOR. I HAVE HAD SEVERAL CALLS AND LETTERS WANTING TO KNOW HOW AND I FINALLY FOUND THE SECRET.
POKE 26112,Ø
    THIS WILL TURN OFF THE MOTOR AND RESET THE DISC CONTROLLER (FI-1ØØ) AT THE SAME TIME. IT WILL REMAIN OFF UNTIL YOU HIT IT WITH ANOTHER COMMAND.
I HAVE NOT HAD ANY PROBLEMS WITH IT SO LET ME KNOW IF ANY COME UP.

NUMBER 2 CHECK OUT THE PROGRAM I PUT IN THE LETTER THIS TIME, IT GOES ALONG WITH THE ONE LAST MONTH TO ALLOW USE OF THE TAPE FOR DATA STORAGE WITHOUT A 'CSAVE' AND 'CLOAD'.

CALL 34930 = THIS WILL CLEAR MEMORY FROM THE END OF YOUR PROGRAM TO THE END OF MEMORY. THIS AREA NORMALLY CONTAINS 'DIM' STATEMENT DATA.

CALL 34949 = THIS WILL CLEAR ALL OF MEMORY AND RESET THE PROGRAM POINTER AT $A4ØØ TO $A4Ø2. IT IS JUST LIKE HITTING RESET AND THE 'EN' KEY.

****

MAINTENANCE HINTS

I'VE BEEN ASKED WHAT KIND OF MEMORY CHIPS WERE USED IN THE 'JUNE' ISSUE MEMORY EXPANSION. THE 16K MEMORY CHIP SOLD AT RADIO SHACK FOR THEIR COMPUTERS WILL WORK OK.

ANOTHER THING FOR THOSE THAT HAVE 'DISK' DRIVES. YOU MIGHT HAVE PROBLEMS RUNNING PROGRAMS FROM IT. THEY APPEAR TO LOAD BUT WILL NOT RUN FOR VARIOUS REASONS. I DON'T THINK THAT THE 'BASIC DOS' CHECKS FOR ERRORS WHEN LOADING SO IF YOU HAVE A BAD DISK DRIVE OR BAD FLOPPY DISK IT CAN CAUSE SOME STRANGE PROBLEMS. I THINK YOU MIGHT HAVE TO GET A DISK CLEANING PACK WHICH IS SOLD AT RADIO SHACK TO CLEAN THE HEAD TO CURE SOME OF THE PROBLEM.

HEY OUT THERE IN COMPUTER LAND EXCUSE THE PASTE UP ON THE LETTER CAUSE I HATE TO SEE BLANK AREAS AND THIS IS THE ONLY WAY I CAN FILL THEM UP. SO DON'T GET CONFUSED IN THE PROGRAMS, WE HAD TO CUT SOME OF THEM UP TO MAKE IT ALL FIT!!!!!!!!!!!!!!!!!!!!

```
1  REM    HERE IS APROGRAM SUBMITTED BY MIKE RUSSELL
2  CALL 17046
5  REM    HUNT THE WUMPUS
10  POKE 24578,54
15  DIM I$(1)
30  PRINT "INSTRUCTIONS? (Y/N)"
40  INPUT I$
50  IF I$="N" THEN 70
60  GOSUB 680
70  DIM S(20,3)
71  PRINT "JUST A MOMENT WHILE I CREATE A  UNIVERSE IN MY RAM CHIPS.": PRINT : PRINT
80  FOR J=1 TO 20
90  FOR K=1 TO 3
100  READ S(J,K)
110  NEXT K: NEXT J
130  DATA 2,5,8,1,3,10,2,4,12,3,5,14,1,4,6
140  DATA 5,7,15,6,8,17,1,7,9,8,10,18,2,9,11
150  DATA 10,12,19,3,11,13,12,14,20,4,13,15,6,14,16
160  DATA 15,17,20,7,16,18,9,17,19,11,18,20,13,16,19
220  DIM L(6)
230  DIM M(6)
240  FOR J=1 TO 6
250 L(J)= INT (20* RND (0)+1)
260 M(J)=L(J)
270  NEXT J
290  FOR J=1 TO 6
300  FOR K=J TO 6
310  IF J=K THEN 330
320  IF L(J)=L(K) THEN 240
330  NEXT K
340  NEXT J
360 A=5
370 Q=L(1)
390  PRINT "HUNT THE WUMPUS"
400  PRINT "---------------"
420  GOSUB 1100
440  GOSUB 1290
450  IF Q=1 THEN 470
460  IF Q=2 THEN 510
470  GOSUB 1370
480  IF F=0 THEN 420
490  GOTO 530
510  GOSUB 1890
520  IF F=0 THEN 420
530  IF F>5 THEN 580
550  PRINT "DUMMY, YOU LOSE--WUMPII JUST    LOVE YOU!"
560  GOTO 600
580  PRINT "O.K. HOTSHOT, THE WUMPII WILL   GET THEIR REVENGE!"
590  PRINT "WUMPII SPIRITS WILL HAUNT YOU   UNTIL THEN..."
600  FOR J=1 TO 6
610 L(J)=M(J)
620  NEXT J
630  PRINT "SAME SET UP? (Y-N)"
640  INPUT I$
650  IF I$<>"Y" THEN 240
660  GOTO 360
680  PRINT "WELCOME TO 'HUNT THE WUMPUS'"
690  PRINT "THE WUMPUS LIVES IN A CAVE OF   TWENTY ROOMS.  EACH ROOM HAS 3  TUNNELS LEADING INTO OTHER"
700  PRINT "ROOMS.  (LOOK AT A DUODECA-     HEDRON TO SEE HOW THIS WORKS.   IF YOU DON'T KNOW WHAT A"
710  PRINT "DUODECAHEDON IS, ASK SOMEONE."
730  GOSUB 2200: PRINT : PRINT
1530 Q=L(1)
1540  FOR K=1 TO J9
1550  FOR K1=1 TO 3
1560  IF S(Q,K1)=P(K) THEN 1720
1570  NEXT K1
1590 Q=S(Q, INT (3* RND (0)+1))
1600  GOTO 1730
1610  NEXT K
1620  PRINT "MISSED"
1630 Q=L(1)
1650  GOSUB 1810
1670  REM    A=A-1
1680  IF A>0 THEN 1700
1690 F=-1
1700  RETURN
1720 Q=P(K)
1730  IF Q<>L(2) THEN 1770
1740  PRINT "AHA! YOU GOT THE WUMPUS!"
1750 F=1
1760  RETURN
1770  IF Q<>L(1) THEN 1610
1780  PRINT "OUCH!!! ARROW GOT YOU."
1790  GOTO 1690
1810 K= INT (4* RND (0)+1)
1820  IF K=4 THEN 1840
1830 L(2)=S(L(2),K)
1840  IF L(2)<>Q THEN 1870
1850  PRINT "WUMPUS GOT YA!!!! DUMMY"
1860 F=-1
1870  RETURN
1890 F=0
```

```
740  PRINT "HAZARDS"
750  PRINT "BOTTOMLESS PIT--THERE ARE TWO   OF THESE.  FALL INTO ONE AND    YOU WILL LAND IN CHINA."
770  PRINT "SUPER BATS--TWO OTHER ROOMS     HAVE SUPER BATS, IF YOU GO THEREA BAT GRABS YOU TO SOME OTHER   ROOM AT RANDOM."
780  PRINT "(WHICH MIGHT BE TROUBLESOME)"
800  GOSUB 2200: PRINT : PRINT
810  PRINT "WUMPUS"
820  PRINT "THE WUMPUS IS NOT BOTHERED BY   THE HAZARDS (HE HAS SUCKER FEET AND IS TOO BIG FOR A BAT TO     LIFT.)"
840  PRINT "USUALLY HE IS ASLEEP.  TWO      THINGS WAKE HIM UP, YOUR        ENTERING HIS ROOM OR SHOOTING   AN ARROW."
850  PRINT "IF THE WUMPUS WAKES, HE MOVES   (P=.75) ONE ROOM, OR STAYS WHEREHE IS (P=.25).  AFTERTHAT, IF HEIS WHERE YOU ARE"
860  PRINT "HE EATS YOU UP (AND YOU LOSE!)."
890  GOSUB 2200
900  PRINT : PRINT "YOU"
910  PRINT "EACH TURN YOU MAY MOVE OR SHOOT A CROOKED ARROW.  MOVING, YOU   CAN GO ONE ROOM (THROUGH ONE    TUNNEL."
930  PRINT "ARROWS.  YOU HAVE FIVE ARROWS---WHEN YOU RUN OUT YOU LOSE.      EACH ARROW CAN GO FROM ONE TO   FIVE ROOMS."
935  PRINT : PRINT : GOSUB 2200
940  PRINT "YOU AIM BY TELLING THE COMPUTER THE ROOM/S YOU WANT THE ARROW   TO GO.  IF THE ARROW CAN'T GO"
950  PRINT "THAT WAY (I.E. NO TUNNEL) IT    MOVES AT RANDOM TO THE NEXT     ROOM.  IF THE ARROW HITS THE    WUMPUS, YOU WIN"
990  PRINT "IF THE ARROW HITS YOU, YOU LOSE"
1000  GOSUB 2200: PRINT : PRINT "WARNINGS"
1020  PRINT "WHEN YOU ARE ONE ROOM AWAY FROM THE WUMPUS OR A HAZARD THE      COMPUTER SAYS:"
1030  PRINT "WUMPUS--'I SMELL A WUMPUS'"
1040  PRINT "BAT--'BATS NEARBY'"
1050  PRINT "PIT--'I FEEL A DRAFT'"
1070  PRINT : PRINT
1080  RETURN
1100  PRINT
1110  FOR J=2 TO 6
1120  FOR K=1 TO 3
1130  IF S(L(1),K)<>L(J) THEN 1220
1140  IF J=2 THEN 1170
1150  IF J=3 THEN 1190: IF J=4 THEN 1190
1160  IF J=5 THEN 1210: IF J=6 THEN 1210
1170  PRINT "I SMELL A WUMPUS"
1180  GOTO 1220
1190  PRINT "I FEEL A DRAFT!"
1200  GOTO 1220
1210  PRINT "BATS NEARBY!"
1220  NEXT K: NEXT J
1240  PRINT "YOU ARE IN ROOM ";L(1)
1250  PRINT "TUNNELS LEAD TO ";S(Q,1),S(Q,2),S(Q,3)
1260  PRINT
1270  RETURN
1290  INPUT "SHOOT OR MOVE (S-M)",I$
1310  IF I$<>"S" THEN 1340
1320 Q=L
1330  RETURN
1340  IF I$<>"M" THEN 1290
1350 Q=2
1360  RETURN
1370  REM    ARROW ROUTINE
1380 F=0
1400  DIM P(5)
1410  INPUT "NUMBER OF ROOMS (1-5)",J9
1430  IF J9<1 THEN 1410: IF J9>5 THEN 1410
1440  FOR K=1 TO J9
1450  INPUT "ROOM #",P(K)
1470  IF K<=2 THEN 1510
1480  IF P(K)<>P(K-2) THEN 1510
1490  PRINT "ARROWS ARE NOT SUPER MAGIC--BE REALISTIC."
1500  GOTO 1450
1510  NEXT K
1900  PRINT "O.K., WHERE TO NOW?"
1910  INPUT Q
1920  IF Q<1 THEN 1900: IF Q>20 THEN 1900
1930  FOR K=1 TO 3
1950  IF S(L(1),K)=Q THEN 2010
1960  NEXT K
1970  IF Q=L(1) THEN 2010
1980  PRINT "ARE YOU FOR REAL, THAT'S NOT    POSSIBLE!"
1990  GOTO 1900
2010 L(1)=Q
2030  IF Q<>L(2) THEN 2100
2040  PRINT "DUMMY, YOU BUMPED INTO A WUMPUS!!"
2060  GOSUB 1810
2070  IF F=0 THEN 2100
2080  RETURN
2100  IF Q<>L(3) THEN  IF Q<>(4) THEN 2150
2110  PRINT "A PIT!!!!CHINA HERE I COME....."
2120 F=-1
2130  RETURN
2150  IF Q<>L(5) THEN  IF Q<>L(6) THEN 2190
2160  PRINT "SUPER BATS!!!! GOOD LUCK!!!!"
2170 Q= INT (20% RND (0)+1)
2180  GOTO 2010
2190  RETURN
2200  FOR I=1 TO 1000000
2210 I=I/10%11/10%11
2220  NEXT I
2230  RETURN
2250  END
```

```
115  GOSUB 300: REM    GO RESET MEM END
130  PRINT Z$(0);Z$(55);Z$(110);Z$(165);Z$(220)
135  REM    LINE 130 IS USED TO PRINT THE ENTIRE BUFFER Z$.
150  NEXT J
160  END
200  POKE 40967,0: POKE 40968,0: POKE 40969,0: POKE 40970,255
240  POKE 41446,0: POKE 41447,255
260  CALL 34040: RETURN
270  REM    LINE 200 SETS LOW AND HIGH TO POINT TO PLACE WHERE WE STORED Z$
280  REM    LINE 240 SETS MEM END TO SAME AS HIGH
290  REM   LINE 260 TURNS ON MOTOR AND RETURNS TO PROGRAM
300  POKE 41446,223: POKE 41447,255: RETURN
310  REM   LINE 300 SETS MEM END BACK TO PROPER SETTINGS. ON 8K MACHINES 41446 SHOULD BE 191.
400  REM   WITH THIS PROGRAM YOU SHOULD BE ABLE TO WRITE YOUR OWN ROUTINES TO ALLOW STORAGE OF DATA
410  REM   ON TAPE AND BE ABLE TO RETREIVE IT. THE REASON I USED LOCATION  0000  TO STORE MY DATA WAS BECAUSE IT IS NOT USED
420  REM    DURING NORMAL . I RECOMMEND THAT YOU USE AT LEAST THE 256 BYTE BLOCKS FOR DATA.
430  REM   I HOPD THAT I HAVE PUT ENOUGH STATEMENTS EXPLAINING HOW TO DO IT AND WHAT EACH STATEMENT DOES. JUST GO SLOW WHEN TRYING
440  REM   TO MODIFY THIS. LINES 1,2,3 ARE VERY CRITICAL AND SHOULD BE USED IN THE EXACT SAME WAY IN YOUR PROGRAMS.
```

```
1  REM  THIS PROGRAM WAS SUBMITTED BY  FRANK NAGELE
2  REM    "THIS PROGRAM IS USED TO DETERMINE THE MEAN AND STANDARD DEVIATION OF A SET OF VALUES FOR A SAMPLE."
3  REM   IF STANDARD DEVIATION IS REQUIRED FOR THE LOT, STATEMENT #160 COULD BE CHANGED TO T=T/(N+1)
10  DIM A(960)
20  FOR K=1 TO 32: PRINT : NEXT
30  INPUT "NUMBER OF ENTRIES",N
40 N=N-1
45 Y=0
50  FOR J=0 TO N
60  PRINT "ENTRY #";J+1;
70  INPUT "       ",A(J)
80 Y=Y+A(J)
90  NEXT J
100 Z=Y/(N+1)
105 T=0
110  FOR J=0 TO N
120 W=Z-A(J)
125 W=W*100
130 W=W*W
140 T=T+W
150  NEXT J
160 T=T/N
165 T=T/100
170 F=T/Z
180  IF F<1.0 THEN 200
190 B=(F*F+T)/(2*F)
191  IF B=F THEN 299
192 F=B
193  GOTO 190
200 T=T*10000
201 F=F*10000
202 B=(F*F+T)/(2*F)
203  IF B=F THEN 290
204 F=B
205  GOTO 202
290 B=B/100
299 B=B/10
300  PRINT "THE MEAN IS",Z
301  PRINT "THE STD DEVIS",B
303  END
1220 W=Z-A(J)
```

```
      EXAMPLES
         A
NUMBER OF ENTRIES?  10
ENTRY # 1  23
  "     # 2  25
  "     # 3  21
  "     # 4  22
  "     # 5  23
  "     # 6  24
  "     # 7  25
  "     # 8  20
  "     # 9  28
  "     # 10 13

AVERAGE IS 22.4000
STD IS 4.0055



B
NUMBER OF ENTRIES?  10
ENTRY # 1  .01
  "     # 2  .2
  "     # 3  .02
  "     # 4  .03
  "     # 5  .3
  "     # 6  .008
  "     # 7  .034
  "     # 8  .02
  "     # 9  .0001
  "     # 10 .024

AVERAGE IS .0646
STD IS .1010
```

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