Low-Cost 6800 Systems Software & Games

by Technical Systems Consultants' staff
Box 2574, W. Lafayette IN 47906

TSC is presently involved in the creation of products which are currently in high demand among computer hobbyists and other micro computer users. Up to this time there has been little or no software available for Motorola 6800 based systems other than Monitor programs in ROM. We have developed many programs both useful and fun which allow the system builder to utilize his creation to its fullest extent. The software listings which we offer implement a variety of user and system type functions. The programs have been written in 6800 assembly language and assembled to run on Motorola and AMI 6800 based systems and utilize I/O routines contained in the MIKBUG* monitor ROM. All references to these external routines are clearly marked, however, facilitating conversion to other I/O routines. The software listings include a fully commented source listing, a hexadecimal machine code dump, sample output, and complete instructions for use. Because software "bugs" are bound to occur regardless of the degree of testing we offer a limited warranty. This 90-day warranty is limited to replacement of the original software listing or providing a patch at the discretion of TSC.

For those requiring the service, all of our routines can be assembled at a custom address or with user supplied I/O routines for an extra charge.

New products are constantly being developed by TSC. These include a Micro BASIC interpreter, a scientific floating point package, a business and accounting system, graphics games, and an 8080 emulator, among others. We also plan to offer some of our programs on "Kansas City" standard cassettes. Hardware items being developed and tested for the 6800 based system include a cassette interface system, A/D and D/A boards, a high speed arithmetic processor and other general purpose items. All of these products will be available when announced in our advertising.

We can only offer what the hobbyists want, so let us know what your needs are in both hardware and software.

*MIKBUG is a registered trademark of Motorola, Inc.

1. HANGMAN: The old word guessing game. Easily modified with your own word list. Requires 640 Bytes. $3.25
2. ACEY-DUCEY: A card game played against the computer. Bet and try to break the bank! Requires 1K Bytes. $3.25
3. CRAPS: A real casino craps game. Match your luck against the computer and try to win money. Requires 1K Bytes. $3.25
4. FLOATING POINT PACKAGE: Full floating point capability. 9 digits of accuracy with exponent range, -99 to +99. Four routines for add, subtract, multiply, and divide are all included. Requires 512 Bytes. $5.00
5. SPACE VOYAGE: Similar to the famous STAR TREK with only a few limitations. Every game is a different adventure! Requires 4K Bytes. $10.00
6. KLINGON CAPTURE: A smaller space simulation game, but, has many of the same surprises. 2K Bytes $4.75
7. STOCKMARKET: Similar to the popular board game of the same name. Simulates real WALL STREET action. Requires 1.5 Bytes. $3.50
8. LINE EDITOR: Allows you to create a file in memory and then completely edit it. Commands are: NEW ADD, INSERT, DELETE, SEARCH, LIST, MOVE, PRINT. Will run in only 512 Bytes! $4.00
9. RANDOM NUMBER GENERATOR: Here is a routine which is an absolute must for writing your own game programs. Requires 60 Bytes. $1.50
10. MASTERMIND: Test your logical abilities; An intricate guessing game requiring both skill and logic. Requires 512 Bytes. $3.00
11. CARD SHUFFLE AND DEAL: Two very useful routines. Includes a driver routine to print out 4 hands of 13 cards each. Requires 512 Bytes. $2.75
12. NUMBER GUESS I: Try to guess the number the computer is thinking of! Requires 256 Bytes. $1.50
13. NUMBER GUESS II: A more advanced number guessing game. Requires 512 Bytes. $2.00
14. HURKLE: Try to find the hiding Hurkle relying upon clues given by the computer. Requires 640 bytes $2.00
15. ROVER: Find and catch the Rover with the aid of hints supplied by the computer. Requires 1K Bytes. $2.50
16. SWITCH: Correctly arrange a random string of digits in the fewest possible moves. Requires 512 Bytes. $2.00
17. CHOMP: A 2 player game which resembles a two dimensional "NIM" game. Requires 512 Bytes. $2.00
18. SUBROUTINE PACKAGE: A special package of very useful subroutines selected by the staff of TSC. This package could save you many hours when writing your own programs. $3.00

**SPECIAL PACKAGE DEALS....Supplied in a 3-ring binder

I. Contains programs 1,2,3,6,9,10 $13.50

II. Contains programs 1,2,3,9,10,11,12,13,14,15, 16,17 $18.95

III. Contains programs in I and II plus 4 and 8 $29.50

**********SPECIAL ANNOUNCEMENT**********

At last there exists a valuable service to the computer hobbyist– THE PROGRAM OF THE MONTH CLUB– For only $2.00 you will get a one year membership. You will receive a monthly bulletin describing the main selection as well as many alternates. Members will receive a 15% discount on the featured program. THERE IS NO OBLIGATION TO BUY ANYTHING! If you join now, you will receive free our Random Number Generator.

[$1.00 handling charge for orders under $10. Add 5% for First Class Mail. Indiana Residents add 4% sales tax.]

PITTSBURGH CLUB HAS 50 MEMBERS & GROWING FAST

There is a club in Pittsburgh. It has about 50 members and is still growing; all sorts of machines and hardware; anybody in Western Pennsylvania, Eastern Ohio or West Virginia who is interested can write:

Pittsburgh Area Computer Club
400 Smithfield St.
Pittsburgh, PA 15205

Or Call:

Eric Liber (Pres.) (412) 276-6546 Nite
Fred Kitman (Treas.) (412) 391-3800 Day

Shooting Stars for Uiterwyk's 6800 Micro-BASIC

Dear Jim, (received July 29, 1976)

My copy of *DDJ* is arriving right on schedule—and full of good stuff too!. Keep up the good work. To help you and/or PCC with that work I am enclosing a copy of my latest game program. This is a version of Shooting Stars (Alias Teaser). The program is written in Micro-BASIC as supplied in the June SWTPC 6800 newsletter. (This interpreter was written by Robert Uiterwyk and Bill Turner, and has provided me with many hours of enjoyment.) Since the Micro-BASIC allows only arithmetic comparisons, I have had to use a rather unusual method for determining which positions are stars and which are black holes. The interpreter and game will fit in 4K of memory if you remove all the REM statements (doesn't REM mean REMOVE anyway?). The game features a randomization of the universe at the start of the game to keep you from getting too complacent or bored if you have a good memory.

By the way, Corvallis is in the Willimette Valley about 80 miles south of Portland. It is the home of Oregon State University—which has a good computer center (with Super Star Trek!). Unfortunately, our town lacks a computer store at present—know anybody who wants to invest in a small business in a community with an active and growing-technically-oriented population? I'd work for a ridiculous wage.

I am currently work on a text editor for my 6800 system which is very similar to the "classy" 8080 editor in your June/July issue. I still have a few commands let to program, but it is now running with the INSERT, DELETE, APPEND, FIND, LIST, CLEAR, TOP, and NEXT commands active. I still have to get the CHANGE command on line. This is not too much of a problem at present since I use a TVT with a 32-character line—it's easy enough to change a whole line, so I left this one until last. Since I am using the cross-assembler on the computer center's CYBER system to write this program I may try to recoup some of my costs by selling the editor in an article where I can get some money for it. Rest assured that unless I change professions (I'm now a grad student in Oceanography), the source code for this and any other programs I find worth spreading around will be distributed at cost (mailing cost—not my development cost—this is a hobby, right?).

Sincerely,

Mark J. Borgerson
325 NW 9th, No. 3
Corvallis OR 97330

If you find that the other hobby mags are unwilling to publish the complete, annotated source code for your Editor, pass it along to us. We do publish useful-though-long program listings —Jim W.

PROGRAMMING NOTES FOR "SHOOTING STARS"

The game of Shooting Stars was originally published in the September, 1974, issue of *People's Computer Company* (under the name of Teaser). It is well described in the May, 1976, *Byte*, so I'm not going to say much about the game itself here. The primary problem in writing the game in Micro-BASIC is finding a way to group the stars and black holes in the universe into the appropriate galaxies. I have solved this problem using an array of nine numbers which are each the product of several prime factors. These are the values of the "F" array in the program. Each point in the universe is assigned a prime number value (the "S" values in the program). A positive value indicates a "Star", and a negative value is a "black hole." The program can then check for stars and black holes with a simple arithmetic comparison (i.e., IF X> 0). Reversing stars and black holes is as simple as changing their signs. The program determines which stars are in a given galaxy by finding all the prime number factors of the "F" value for that position. The appropriate galaxy is then reversed. The integer arithmetic of the Micro-BASIC interpreter allows checking for the factors of a number in the following manner:

Suppose we have A = 3
B = 12
then (B/A)*A = 12/3 * 3 or 12
But if B = 5 then (B/A)* A = 10
because 12/5 = 2.4 and this is truncated to 2.

This is the type of test which is performed in line 780 of the program. If the S value divides evenly into the F value the appropriate point in the galaxy is inverted. A FOR—NEXT loop checks and inverts the appropriate points in the complete universe. The same technique of checking for even division is used to print the carriage returns after each third point to produce a square matrix display (line 890).

The "S" values must be prime numbers to ensure that no extra factors creep into the "F" values which are the product of the appropriate "S" values for each galaxy.

This program should run in any other type of Tiny BASIC which will handle-one-dimensioned arrays. You will have to change the RND statement (380, 390) to fit your random number generator. The RND statement in Micro-BASIC produces a random integer between 1 and 32,762. Line 390 causes the starting universe to be biased toward black holes; roughly two black holes for each star. The program can easily be converted to a scale basic interpreter by using the INT function when checking for factors. For example, line 780 would become: 780 IF(INT(F(X)/S(K))*S(K) = F(X) LET S(K) = – S(K).

If you're not using a TVT with cursor control, change line 840 to a simple "print" or whatever form of page control you need.

Good Luck!

```
00100 REM  SHOOTING STARS IN 6800 MICRO-BASIC.
00110 REM  MARK BORGERSON 7-23-76
00120 REM  DESIGNED FOR SWTPC 6800 WITH TVT-II(CT-1024).
00130 DIM F(9),S(9)
00140 REM  THE FOLLOWING STEPS ENTER THE INITIAL VALUES OF THE
00150 REM F AND S ARRAYS.(MICRO-BASIC HAS NO DATA AND READ STATEMENTS)
00160 S (1)=-23
00170 S(2)=-3
00180 S(3)=-19
00190 S(4)=-11
00200 S(5)=2
00210 S(6)=-5
00220 S(7)=-13
00230 S(8)=-7
00240 S(9)=-17
00250 F(1)=1518
00260 F(2)=1311
00270 F(3)=570
00280 F(4)=2089
00290 F(5)=2310
00300 F(6)=1615
00310 F(7)=2002
00320 F(8)=1547
00330 F(9)=1190
00340 REM INITIALIZE SHOT COUNTER
00350 C=0
00360 REM RANDOMIZE STAR AND BLACK HOLE PATTERN
00370 FOR I=1 TO 9
00380 X=RND
00390 IF X>20000  S(I)=-S(I)
00400 NEXT I
00410  REM PRINT INITIAL PATTERN
00420 GOSUB 840
00430 REM GET FIRST SHOT
00440 PRINT "YOUR SHOT";
00450 INPUT X
00460 REM INCREMENT SHOT COUNTER
00470 C=C+1
00480 REM CHECK FOR VALID SHOT
00490 IF S(X)>0 GO TO 530
00500 PRINT"YOU CAN ONLY SHOOT STARS"
00510 GO TO 440
00520 REM INITIALIZE SCORING COUNTER
00530 B=0
00540 REM INVERT(CHANGE SIGN) OF APPROPRIATE GALAXY.
00550 GOSUB 770
00560 REM CHECK SCORE BY ADDING STAR VALUES
00570 FOR L=1 TO 9
00580 B=B+S(L)
00590 NEXT L
00600 REM PRINT OUT MODIFIED UNIVERSE
00610 GOSUB 840
00620 REM IF B=-100 ALL POINTS ARE BLACK HOLES
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continued

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00630 IF B=-100 GO TO 690
00640 REM IF B IS NEITHER -100 NOR 96 GAME CONTINUES
00650 IF N<>96 GO TO 440
00660 PRINT"YOU WIN"
00670 PRINT"YOU FIRED "J;" SHOTS."
00680 GO TO 700
00690 PRINT"YOU LOST"
00700 PRINT "TO PLAY AGAIN TYPE 'RUN', CR."
00710 GO TO 950
00720 REM THE FOLLOWING SUBROUTINE CHECKS TO SEE IF THE F VALUE
00730 REM FOR THE SHOT CAN BE EVENLY DIVIDED BY THE SVALUE
00740 REM FOR EACH POSITION.  IF  S DIVIDES INTO F WITHOUT
00750 REM  A REMAINDER, THE STAR OR BLACK HOLE IS INVERTED
00760 REM (ITS SIGN IS CHANGED)
00770 FOR K=1 TO 9
00780 IF(F(X)/S(K))*S(K)=F(X)  S(K)=-S(K)
00790 NEXT K
00800 RETURN
00810 REM THIS SUBROUTINE PRINTS OUT THE GALAXY
00820 REM STATEMENT 9500 DOES A HOME UP AND ERASE OF SCREEN ON TVT
00830 REM EQUIPPED WITH COMPUTER CURSOR CONTROL.
00840 PRINT"<CNTRL-P><CNTRL-V>"
00850 FOR J=1 TO 9
00860 IF S(J)<0  PRINT"  ·";
00870 IF S(J)>0  PRINT"  *";
00880 REM IF J ISN'T DIVISIBLE BY 3, SKIP CARRIAGE RETURNS.
00890 IF J/3=3<>J  GO TO 920
900 PRINT
910 PRINT
920 NEXT J
930 RETURN
940 REM END OF SUBROUTINE AND GAME
950 END
READY.
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A PL/6800 CROSS COMPILER

Intermetrics, 701 Concord Ave., Cambridge MA 02138, is reported to have a PL/M-type cross compiler for the 6800.

SINGLE-CHIP CONTROLLER FOR 6800

Motorola has scheduled a single-chip controller for the 6800 m-p for delivery around the second quarter of 1977. Designated the 6802, it will have 8K bits of ROM, 256 bits of RAM, and will include I/O capabilities.

(ANOTHER) L.A. STORE: THE DATA CENTER

Gentlepersons: May 13, 1976

We are currently opening "The Data Center," another micro-computer store, in the Los Angeles area.

Sincerely,

Mel Norell
General Manager
Programma

3400 Wilshire Blvd.
Los Angeles CA
90010

SPACE GAMES MARATHON (IN MENLO PARK, CA)

The Community Computer Center, 1919 Menalto, Menlo Park, CA 94025, is having a computer marathon on August 20th and 21st. During the 24-hour period beginning at 9 PM, Friday evening, the Center will offer reduced rates for computer time ($1.20/hour), and will charge a one-time admission fee of 50 cents. There will be 25 door prizes each being an hour of free computer time at the Center.

There will be for-fun (non-prize) competition for such things as most ships destroyed, longest time, etc.

6800 TBX FOR FREE . . . BUT IT'S SOFTCOPY

Dear Folks, 12 June 1976

The receipt yesterday of *DDJ* [Vol. 1, No. 3], and the continued inability or unwillingness of Sphere to deliver a BASIC interpreter has motivated me to write you with some good news and some bad news.

First, the good news:

I am willing to place in the public domain a running version of TBX which I developed for my 6800 (Sphere) system. It contains all of the features of TBX as published in *DDJ* [Vol. 1, No. 2], including the DATA statement; plus REMarks, LOAD & SAVE (tape cassette commands), EDIT & CLEAR (CRT commands), and PRINT formatting with a ';' for concatenation with no space.

Now the bad news:

My listing is in the same sort of shape as the TBX one you published—probably for the same reasons—i.e., hand-written on about 55 IBM assembler coding sheets, hand-assembled into hex.

Additionally, the code jumps about to patch locations, is CRT-oriented, and uses routines in the Sphere-supplied PROM monitor whenever possible.

If you would be interested in publishing this, (and can scrape up the necessary volunteer labor to type it into your format) I will send you a copy of the listing plus a page or so of comments about the significant differences from TBX as you published it. Please let me know.

Sincerely,

Chuck Crayne

734 S. Ardmore Ave
Los Angeles CA 90005

Well, all you 6800 fans who have been yelling for software . . . How 'bout pitching in and gening some publishable=sharable hardcopy and documentation? —JCW, Jr.

AMI 6800 EVALUATION KIT INCLUDES TINY BASIC

American Microsystems, Inc., 3800 Homestead Rd., Santa Clara, CA 95051, is marketing a 6800 Microprocessor Evaluation Board. It includes the 6800 version of Tiny BASIC, a ROM-resident prototyping operating system, and a built-in EPROM programmer. In kit form with a PC (evidently without memory?), it is $295. With 512 bytes of EPROM, the kit is $595. A fully assembled kit with 2K bytes of EPROM is $950.

SOMEONE COPIES 6800 TINY BASIC...AND PAYS, ANYWAY

Tom Pittman, [Box 23189, San Jose, CA 95153] who is offering an excellent version of Tiny BASIC for the 6800 for $5, told us of receiving a five dollar payment from someone who said he had already copied the documentation and paper tape (from a friend) and was sending the payment "retroactively".

FAR OUT! (As we used to say in the '60's). We applaud and encourage such actions by hobbyists. We feel Tom is charging a fair price for a good product. This case supports our theory that reasonably priced software will not be "ripped off" by hobbyists.

We actively encourage the continuation of such ethical behavior on the part of hobbyists, relative to fairly-priced software. We believe that it will encourage Tom and other computer pros to continue to develop excellent software and offer it to the hobbyist community at reasonable prices. We applaud such action by vendors such as Processor Technology, Apple Computer, Southwest Texas Products, Digital Research, and others.