

SWTPC 6800 COMPUTER NEWSLETTER
Southwest Technical Products Corporation
219 W. Rhapsody
San Antonio, Texas 78216
Issue No. 2. October 1976



SWTPC WELL REPRESENTED AT PCC '76

Southwest Technical Products had a busy double booth at the Personal Computing Convention on August 28th and 29th in Atlantic City, New Jersey. We had two complete systems up and running and were amazed at the number of people who came by to ask questions and buy their copy of 4K Basic (C). Microcomputer Systems Inc., one of our Florida dealers, helped us out by providing us with some knowledgeable personnel and stock for those customers wanting to take their purchases with them

The convention was obviously an outstanding success. Our only complaint was that the convention was held in Atlantic City. It seemed that most all of the hotels/motels in the area left a lot to be desired. We always had to travel in groups (safety in number algorithm). The lack of air conditioning in the convention exhibit area was of no help either.

The equipment worked but the operators didn't. Maybe us Texans leave been spoiled by all of this good living.

Pictured above from left to, right are Bill Thames, Rep. of Microcomputer Systems; Ted Uiterwyk, Software Debugger; Robert Uiterwyk, Author of Microbasic and 4K Basic(C); Gary Kay, SWTPC Engineer; Dan Meyer President of SWTPC; and Joe Deres, SWTPC Engineer. The photo was taken by Jim Stratigos of the Atlanta Area Microcomputer Hobbyist Club. Jim spent most of his time at the convention helping us out at the booth. Also helping were Bill Blomgren, Rep. of Microcomputer Systems; Forrest Hurst, Mgr. of Microcomputer Systems; Warren Startup, Representative of Microcomputer Systems; and last but not least Steven Uiterwyk, Software Debugger.

Scanned and edited by Michael Holley March 31, 2001
Southwest Technical Products Corporation Document Circa 1976

SWTPC 4K BASIC VERSION 2.0 (C)

We are now distributing 4K Basic Version 2.0 (C), for those of you who bought versions 1.0 (C) or 1.1 (C). The differences and improvements are noted below. At the prices we are charging we cannot afford to continuously update tapes for those customers who bought an outdated version. So if you want version 2.0, send us another \$4.95 and we will send you a new cassette tape and manual.

Features

- 1) An APPEND command has been added which functions as a LOAD command, but does not erase the previous source file.
- 2) On an INPUT command, failure to enter multiple variables when required is now properly handled. Also, entering an erroneous value such as a null or string is responded to by a reply of "RE-ENTER" instead of a forced exit from the Basic program.
- 3) Using Control X for line cancel now gives the reply "DEL" for deleted.
- 4) You may now use either CHR or CHR\$ to call the character function. The CHR\$ allows you to enter hex values rather than decimal values which are used by the CHR function.
- 5) FOR-NEXT loops will now allow a premature exit from a nested group without issuing an error 18. It should also be noted that 4K Basic Versions 1.1 and 2.0 (C) allow negative steps. This was not noted in the manual. Example: FOR I=10 TO -1 STEP -1
- 6) The INT function has been corrected so that values between 0 and -1.0 now correctly return -1.
- 7) The overflow checking routine (error 14) did not catch an overflow if it wrapped around memory. Example: DIM C4(255,255). This has been corrected.
- 8) Addition, subtraction and comparisons did not work correctly if one element was zero, and the other less than 1.E-10. This has been corrected.
- 9) Entry of an incorrectly formatted LIST command (Example: LIST 40,10) will now merely list from line 40 to the end of the source file.
- 10) Occasionally Basic 1.1 (C) gave an error 13 when it should have been an error 6. This has been corrected.
- 11) One of the fixes incorporated into Basic 1.1 (C) removed the truncation of some mathematical results to nine digits. This has been restored.
- 12) The system will no longer insert a null line. A null line is an entry with a line number but no statement following it.
- 13) 0.001 - 0.01 erroneously gave a positive answer. This has been fixed.
- 14) An underflow of 1.E-100 or 1.E-101 was not recognized and the value was not set to zero, thus a funny print value was returned. This has been corrected.
- 15) A multiplication or equivalent division of a small number (Example: 1E-70 * 1E-70' such that the result was less than 1E-127 gave a result of 9.99999999E99 rather than zero. This has been fixed.

The following corrections were made between Basic 1.0 (C) and 1.1 (C):

- 1) A divide 90 by 9.XXXX gave a result of zero. This was fixed.
- 2) Repeated multiplications of zero times a number occasionally created an error. This has been corrected.
- 3) SGN(0) was originally defined to be 1 whereas it should have been 0. This was changed in version 1.1 and you are asked to change your manuals accordingly.

PATCH FOR 4K BASIC (C)

If you have been having problems with the 4K Basic (c) SAVE and LOAD commands not working properly with the AC-30 cassette interface try the following patches: Version 1.0 and 1.1 - make 029D₁₆ a 1E₁₆. Version 2.0 make 02AF₁₆ a 1E₁₆.

SWTPC 8K BASIC

SWTPC 8K Basic (C) is now in the field testing stage and we expect to start delivering tapes and manuals soon. The price will be \$9.95 for the "Kansas City" cassette tape and manual combination. 8K Basic (C) has the features of 4K basic (C) plus string handling capabilities with string arrays, trigonometric functions, exponentials and all sorts of other neat things. It is fundamentally full ANSI Basic with some additions and some small limitations due to the fact that we are using a microcomputer rather than an IBM 370.

MOD FOR MICROBASIC

If you are still using the SWTPC Microbasic package you might want to change memory location 036C from a 08 to a 1B. This will insure more random numbers when using the random number generator. If you have been having problems with your Microbasic not working properly and the memory diagnostics all check good, then you probably transposed some B's with some 8's or vice versa when you loaded Microbasic. The version of Microbasic

printed in the first newsletter is accurate and does work:

ANIMALS FOR THE SWTPC 6800

SWTPC is now offering the ANIMALS game for the SWTPC 6800 thanks to the efforts of Doug Domke. The game of "Animals" was originally written in BASIC at DEC by Nathan Teichholz and is presented in "101 Computer Games" as an example of artificial intelligence.

This version of the game unlike the original which uses disk files, operates completely within the RAM of a SWTPC 6800 Computer System Although the program itself only requires 650 bytes of code, it theoretically has the ability to use up any amount of RAM as it "learns." In practice, however, even a 2K system is large enough to make the game very enjoyable.

The program itself is actually a guessing game. The program attempts to guess what animal the user is thinking of. If it fails, it will request the name of the animal, followed by a request for the user to supply a question which, when answered to the affirmative, would distinguish the correct answer from that guessed (incorrectly) by the program. This information then becomes a part of the program.

In response to the questions "Are you thinking of an animal?", the user may respond in one of four ways:

Y(ES) - the game continues

N(0) - the program exits to MIKBUG

L(IST) - the program lists its vocabulary of animals

C(LEAR) - the program clears everything it has learned and reverts to its initialized (dumb) state.

SWTPC CASSETTE TAPE PROGRAM LIBRARY

The following programs are available from SWTPC on AC-30 (Kansas City) formatted audio cassette tape:

- MP-EC Editor/Assembler package with manual. Requires 8K of memory to run. \$14.95 ppd. in US.
- BAS4C 4K Basic Version 2.0 (C) with manual. Requires at least 6K of memory - 8K preferred. \$4.95 ppd in US.
- GAMIC Tic-Tac-Toe and Blackjack as listed in the notebook and newsletter. Require 6K of memory to run. \$4.95 ppd in US.
- BAS8C 8K Basic (Available shortly) with manual. Requires at least 8K of memory 12K preferred. \$9.95 ppd in US.
- ANIMC Animals program. A children's learning game. Requires 2K of memory. \$4.95 ppd. in US.

SWTPC BASIC AVAILABLE ON PAPER TAPE

SWTPC has decided to offer 4K and 8K Basic (C) on paper tape:

- BAS4P 4K Basic Version 2.0 (C) with manual. Requires at least 6K of memory - 8K preferred. \$10.00 ppd. in US.
- BAS8P 8K Basic with manual. Requires at least 8K of memory - 12K preferred. \$20.00 ppd. in US. (Available Nov. 15, 1976.)

MOD FOR THE AC-30 CASSETTE INTERFACE

If you have been having trouble with your AC-30 not loading programs properly to the computer or while operating with the terminal in the LOCAL mode, try changing capacitor C10 on the AC-30 from a 1000 pfd capacitor to a 2700 pfd capacitor. Another suggestion from Rick Hammond of CBS Radio is to change resistor R22 from a 10K ohm to a 1K ohm resistor. These

changes insure the reliability of the AC-30 generated UART clock.

In order to prevent damage to the AC-30's reed relays by tape recorders with high motor transient currents, it is suggested that you make the following component additions:

- () Insert a 2.2 ohm 1/2 watt resistor in series with the wire going to jack J10 terminal A. Install the resistor right at jack J10.
- () Solder a 0.1 mfd capacitor across jack J10 terminals A and B.
- () Insert a 2.2 ohm 1/2 watt resistor in series with the wire going to jack J11 terminal A. Install the resistor right at jack J11.
- () Solder a 0.1 mfd capacitor across jack J11 terminals A and B.

If you have easy access to the REMOTE jack terminals on the inside of the tape recorder, attach a 200 PIV 1 amp diode (1N4001) across the two terminals. Be sure you install the diode so it is oriented with the banded end to the positive terminal. Use a voltmeter to determine which terminal is which. If you put the diode in backwards, the remote circuit will no longer stop the recorder's motor.

CLEAN PAGE MOD FOR THE CT-1024

If you would like to have your CT-1024 come up with an erased frame each time the cursor cycles thru to the top of a new page, you can do so with a one modification from the top ride of the main board:

Using a pair of pointed dykes, carefully cut the pin 3 lead of integrated circuit IC 2 right where the lead goes into the top foil of the main circuit board. Carefully pry this lead up and away from the foil and solder a 12" piece of light gauge wire to it. Attach and solder the other end to pin 6 of IC 28.

Now each time the terminal starts printing at the top of a new page, the screen will first be erased. The erase will be complete if the cursor is not located in the first character position when the new page is selected so take note.

PLEXIGLASS ENCLOSURE FOR THE CT-1024

Microcomputer Systems Inc. of Tampa, Florida has developed an enclosure which will hold a SWTPC CT-1024 Terminal System with power supply. It even has room left over to fit in a GT-61 Graphics Terminal along with its power supply, so the benefits of having both inside the same enclosure may be realized.

The case is made of 1/4" PLEXIGLASS and is 15" wide X 17" deep X 6" tall. It comes in two colors: clear and smoked. The smoked color is a dark bronze and makes it difficult to see the components inside the case. There are holes provided for two DB-25 (RS-232) connectors as well as several holes for ventilation. There is a large cutout for the SWTPC KBD-5 keyboard with PLEXIGLASS standoffs for mounting it. The case even has molded feet and polished edges. The cost is \$65.00 ppd. in the US. (specify color when ordering)

Order from:

Microcomputer Systems, Tnc.
144 S. Dale Mabry
Tampa, Florida 33609
(813) 879-4301 879-4225

PLEXIGLASS COVER FOR THE PR-40

Microcomputer Systems Inc. of Tampa, Florida is also offering a Plexiglas cover for our PR-40 Alphanumeric Printer. The cover slips right over the PR-40's chassis and is available in clear and smoked versions. The cost is \$20.00 ppd. in the US. (specify color when ordering)

Order from:

Microcomputer Systems Inc.
144 S. Dale Mabry
Tampa, Florida 33609
(813) 879-4301 879-4225

METAL ENCLOSURE FOR THE CT-1024

If you have been looking for a metal enclosure for your CT-1024 Terminal System, you might want to contact:

D.W. Ekstrand
P.O. Box 1260E
Southgate, Calif. 90280
(213) 566-1677

This man has been making attractive cases for the terminal system for some time now. The cases are allodyned aluminum with welded seams. Configurations are offered for several keyboards so write the man for complete information and pricing.

SWTPC 6800 PROTOTYPING BOARDS

If you have been looking for prototyping boards for the SWTPC 6800 Computer System, Personal Computing Company is now selling prototyping cards for both the large and small board positions. The PC boards are single sided plated boards and will accept 14, 16, 24, and 40 pin IC sockets. Both boards are provided with holes for SWTPC 6800 compatible connectors on both the top and bottom edges, however the Molex connectors are not supplied. Provisions have been made on each card for an on board 7805 regulator also not supplied. The large board sells for \$19.95 while the small goes for \$9.95. See their advertisement with photographs on page 112 in the October 1976 issue of 73 magazine.

Personal Computing Company
3321 Towerwood Drive, Suite 107
Dallas, Texas 75234

NEWS FROM MIDWEST SCIENTIFIC

Midwest Scientific tells us they have two Basic packages, a disassembler, and miniassembler that are SWTPC 6800 compatible. They are also advertising a PROM board and a floppy disk with software. Check with them on prices and delivery. See their add on pages 58 and 59 of the October 1976 issue of Byte magazine.

Midwest Scientific Instruments Inc.
220 West Cedar
Olathe, Kansas 66061

EPROM BOARDS COMING FOR THE SWTPC 6800

We have been notified by two independent firms that they are working on EPROM boards plug compatible with SWTPC 6800 Computer System. Neither manufacturer has a sellable product at this time, however, both should be available by the time of our next newsletter. The PROM boards will use either 2704 or 2708 EPROMS. 1702's are too slow for the SWTPC 6800's memory cycle time.

PR-40 CHARACTER ADDITION

According to David M. Alexander, the underline character ($5F_{16}$) can easily be added to the SWTPC PR-40 Printer's Character font by the addition of two short wires which are tack soldered to the top or bottom of the PR-40 main circuit board. A spare open collector buffer is used to "wire-or" the pin 15 and 16 outputs of the character generator, IC2, into the input circuit of solenoid driver #7. The modification should be made as follows:

- 1) connect a wire from, IC2 pin 15 to IC7 pin 11.
- 2) connect a wire from IC7 pin 10 to IC7 pin 6.

MORSE CODE PROGRAM FOR THE SWTPC 6800

If you are interested in a Morse code program for the SWTPC 6800 Computer System, you might want to check out Wayne Sewell's program which appeared on page 42 of the October 1976 issue of Byte Magazine. Although the program was written to run on any 6800 system, it was written specifically for the SWTPC 6800.

FASTER PROGRAM LOADS FROM CASSETTE

SWTPC will be supplying the longer program cassette and paper tapes such as Basic (C) in binary form. By doing this program loading time will be decreased by a factor from two or three to one, depending upon the length of the program. At the beginning of each tape is an ASCII formatted binary load routine. When you start loading your program tape, the computer actually loads in the binary loader program first. The G necessary to start this program is actually recorded on the tape so the program initiates itself. Following the binary loader program is the actual program to be loaded. The program is stored on the tape in binary so its length is about one third that of the same program stored in ASCII. The memory locations used by the binary loader program have been chosen so as not to conflict with the memory locations of the program to be loaded into memory.

MODIFICATION TO BASIC 2.0 (C) TO DRIVE
THE SWTPC PR-40 ALPHANUMERIC LINE PRINTER

By: W. C. Thames
Microcomputer Systems, Inc.

When the following code is added to Basic Version 2.0 (C), the PR-40 printer will be operated directly from the Basic interpreter. Basic will then print data on the terminal first, followed by the same data on the PR-40 printer. Changing the data in memory location 1219₁₆ from a 7E to a 39 will eliminate the terminal's printout entirely. If you wish to disable just the PR-40's printout, simply turn off the PR-40. Do not turn off the printer while the computer is outputting data. Doing so will interrupt the normal handshake routine and will cause the computer to lock up. This modification is only usable on the SWTPC PR-40 Alphanumeric Printer and in most cases will not drive other printers.

The patch has been written to output all printer data to a MP-L I/O board located at I/O card position #7 of a SWTPC 6800 Computer System. If you wish to relocate this interface to another card position simply change the address in memory locations 1204₁₆ and 121D₁₆ to the address of the desired MP-L parallel interface board.

1200 37	121A E1	1234 F5	0101 12
1201 DF	121B D1	1235 8D	0102 1C
1202 1E	121C CE	1236 F3	
1203 CE	121D 80	1237 86	0273 12
1204 80	121E 1C	1238 20	0274 2A
1205 1C	121F C6	1239 20	0276 12
1206 A7	1220 FF	123A 0E	0277 33
1207 00	1221 E7	123B 44	
1208 C6	1222 00	123C 44	027B 12
1209 36	1223 C6	123D 44	027C 00
120A E7	1224 3E	123E 44	
120B 01	1225 E7	123F 84	02AF 1E
120C C6	1226 01	1240 0F	
120D 3E	1227 7E	1241 8B	07F9 12
120E E7	1228 08	1242 30	
120F 01	1229 0E	1243 81	07FA 4C
1210 6D	122A A6	1244 39	
1211 01	122B 00	1245 23	
1212 2A	122C 8D	1246 02	
1213 FC	122D 0D	1247 8B	
1214 E6	122E A6	1248 07	
1215 00	122F 00	1249 7E	
1216 DE	1230 08	124A 12	
1217 1E	1231 20	124B 00	
1218 33	1232 0C		
1219 7E	1233 8D		

4K AND 8K BASIC (c) EXTERNAL SUBROUTINE CALLS

Basic Version 1.0 and 1.1

```
0260 7E E0BF OUT2H JMP $E0BF DUT2H IN MIKBUG
0263 7E E0C8 OUT4HS JMP $E0C8 OUT4HS IN MIKBUG
0266 8D 09 OUTCH BSR BREAK
0269 7E E1D1 JMP $E1D1
0268 BD E1AC INCH JSR $E1AC INEEE IN MIKBUG
026E 36 PSH A
026E 20 08 BRA BREAK0
0271 36 BREAK PSH A
0272 B6 8004 LDA A $8004
0275 2B 09 BMI BREAK1
0277 8D F2 BSR INCH
0279 81 03 BREAK0 CMP A #$03 .
027B 26 03 BNE BREAK1
027D 7E 0812 JMP READY
0280 32 BREAK1 PUL A
0281 39 RTS
```

Basic Version 2.0

```
0272 7E E0BF OUT2H JMP $E0BF DUT2H IN MIKBUG
0275 7E E0C8 OUT4HS JMP $E0C8 OUT4HS IN MIKBUG
0278 8D 09 OUTCH BSR BREAK
027A 7E E1D1 JMP $E1D1
027D BD E1AC INCH JSR $E1AC INEEE IN MIKBUG
0280 36 PSH A
0281 20 08 BRA BREAK0
0283 36 BREAK PSH A
0284 B6 8004 LDA A $8004
0287 2B 09 BMI BREAK1
0289 8D F2 BSR INCH
028B 81 03 BREAK0 CMP A #$03 .
028D 26 03 BNE BREAK1
028F 7E 0815 JMP READY
0292 32 BREAK1 PUL A
0293 39 RTS
```