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User Guide

BASIC Surrogate

INTRODUCTION

The Radio Shack TRS-80 Model II microcomputer comes equipped with a disk BASIC provided by MicroSoft very similar to the $350 MicroSoft CP/M™ version 5.0. Now it is possible to make use of this fine BASIC interpreter under the ATON CP/M and gain the advantages CP/M offers:

1. Greatly improved disk file system performance and reliability.

2. Removes the need to purchase another BASIC interpreter program configured for CP/M. This can mean a net savings of up to $275 in out-of-pocket expense alone.

3. With ATON CP/M Level II, offers 2K more space (35656 bytes total) than available under TRSDOS.™ With ATON CP/M Level I, allows 6K less space than available under TRSDOS.

4. Allows the PRINT @ command to be used as under TRSDOS.

5. Allows DATE$ and TIME$ functions to be used as under TRSDOS except that Julian date (day of year) is not supported.

6. Some BASIC program modifications are still required to accommodate video display control sequence differences and CP/M file names, but usually much less work will be required than when using other versions of BASIC available under CP/M.

The BASIC interpreter can be brought over to CP/M by combining it with the Surrogate Program described here. The composite program then has the capability of reading/writing CP/M compatible files. TRSDOS files and ASCII programs can also be transferred over for use under CP/M.

The new BASIC behaves almost exactly as if it were under TRSDOS, but the "almost" deserves a few paragraphs of explanation. The differences are evident in a few specific areas - the CRT, the disk file structure and operating system calls.

CRT

The Surrogate program passes CRT control codes directly through to CP/M, and since CP/M uses different codes than TRSDOS, the user must consult his CP/M documentation for codes applicable. The screen will be cleared, however, by both the CP/M code, the TRSDOS decimal 27 code and the CLS command. The PRINT @ and COL functions are implemented, but ROW returns zero.

DISK

CP/M has a different file structure than TRSDOS, so the Surrogate Program conforms to CP/M as much as possible. The TRSDOS random file structure is used with record length up to 256 bytes. CP/M file names are used, however. This permits ambiguous file references with question marks as "wild cards." Examples of file names used in BASIC are:

```
10 OPEN "D",1,"B:PARTFILE.DAT",130
20 KILL "TEST?.BAS"
```

There are two main differences between CP/M files and TRSDOS files which deserve special consideration. (1) A read error may occur if the user tries to GET a record which has not been written. (2) CP/M can't implicitly determine record length, such as that on LOADing programs so **compressed** ASCII files must be distinguished from ASCII **text** files by the file type 'CAS'. The program will not permit a file to be saved in compressed format without the 'CAS' file type.

Contrary to the Radio Shack manual, the BASIC 1.2 **rename** syntax is:

```
NAME oldfile AS newfile.
```

This is implemented through Surrogate.

OPERATING SYSTEM CALLS

CP/M provides no means of executing a console command then returning to the calling program. Thus the SYSTEM "command" function does allow disk initialization, directory listings and setting the system time and date.

DISK INITIALIZATION: SYSTEM "I"

DISK DIRETORY: SYSTEM "Dir n" where n=0 for the default drive
n=1 for CP/M drive 'A'
n=2 for CP/M drive 'B' etc.
SYSTEM "D" or "DIR" accesses the default drive

TIME/DATE SET: A sample call is given:

```
10 SYSTEM "THUJUL03198018511.19.00074"
```

The time is underlined. The date format is described in the TRSDOS manual. The TIME$ and DATE$ functions return the values input via SYSTEM. SYSTEM sets the internal clock and calendar, and TIME$ returns the clock time. Note that the Julian date is not maintained.

SYSTEM with no parameter string exits to CP/M.

LINE PRINTER

The LLIST and LPRINT commands utilize the CP/M defined list device.

USER SUBROUTINES (Assembly language programmers only)

Location 103H,104H points to the first free location in memory for patching user subroutines. The last usable location is 27FFH. Subroutines may be loaded here via DDT and stored permanently as part of the BASIC.COM module.

CRT/KEYBOARD MAPPING

BASIC Surrogate has a mapping table for both keyboard and CRT that undoes the mapping in CP/M. It assumes that the CP/M mapping is as delivered, i.e., SYSDEF has not been used to modify the CP/M keyboard or CRT mapping tables. If this is not the case, then you can use DDT to modify the tables in BASIC.COM. The CRT tables are at A20H and the keyboard table is at 98AH.

Some CRT codes (1, 2, 3 and 8) are processed by BASIC Surrogate code. All others are handled by translation:

BASIC	CP/M
0D	1F
14	1E
17	ESC, 54
18	ESC, 59
19	ESC, 28
1A	ESC, 29
1B	1A
1C	08
1D	0C
1E	1A
1F	1A
F9	ESC, 28
FA	ESC, 29
FB	1E
FC	08
FD	0C
FE	0B
FF	0A

Other characters not in the table are passed straight through to CP/M. The CP/M interpretation of cursor moves is at variance with TRSDOS when wraparound is required, particularly in the graphics mode (FC, FD, FE, FF).

BASIC PROGRAM FILES

Programs currently running under TRSDOS are transferred via RSCPM. The programs should be in ASCII format, not compressed ASCII. After the programs are brought to CP/M you may not be able to TYPE or LIST them because of the absence of line feeds. This is easily solved by passing them through an editor or by LOADing and SAVEing them via BASIC itself.

PROCEDURE FOR MOVING BASIC FROM TRSDOS TO CP/M

1. **Load and boot a CP/M disk on Drive A containing the files specified above.**

2. Type 'RSCPM' to load the TRSDOS-to-CP/M utility program. If you have a multi-drive system, specify the TRSDOS drive as drive B; otherwise specify it as drive A. You will be prompted for CP/M and TRSDOS filenames. Type BASIC in both instances.

3. The BASIC program is now copied onto the CP/M disk on Drive A. This takes a while. You may wish to transfer a short BASIC program (ASCII format) at this time also. Hit the BREAK key to exit as prompted.

4. When transfers are complete and control is returned to CP/M, type 'SUBMIT BASIC' and wait a while. The end result of this operation is a file BASIC.COM which is the ready-to-run BASIC interpreter.

5. Type 'BASIC BAGELS.BAS' which should put you into the sample BASIC program.

INSTALLING BASIC

The Model II BASIC Package includes the following files:

BSUR.HEX	- The TRSDOS Surrogate module which lets Model II BASIC run under CP/M
BASIC.SUB	- The automatic command file which binds SURROGATE to Model II BASIC
BAGELS.BAS	- A trivial BASIC program to test system integration
RSCPM.COM	- The TRSDOS-to-CP/M file transfer utility

If the BASIC package has been purchased at a different time from ATON CP/M, use PIP to copy all the files from the distribution disk to a double density CP/M disk already containing the utilities SUBMIT.COM and XSUB.COM. Put the distribution disk in your files for backup purposes.

You will now have to execute a procedure to get BASIC ready to run. You only need to do this once, since the end result is a file BASIC.COM. **Note that this composite file BASIC.COM contains material copyrighted by both ATON International and MicroSoft and may be copied only in accordance with the appropriate software licensing agreements.**

HOLD KEY

The function of the HOLD key under TRSDOS can be obtained by using CTRL ' under ATON CP/M.

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TRSDOS is a trademark of Tandy Corp.