

To activate TURBO, boot your normal DOS then type

COMPILER> *← Actually, type TURBO*

The prompt

MEM SIZE or FILESPEC OF SOURCE?

will be displayed. If you need to reserve memory for machine code, type the number you would normally type when using the program you are compiling. You will then be prompted for the FILESPEC again.

If however, you are compiling a program which consists of pure BASIC code, simply type the filespec of the BASIC program followed by <ENTER>. The BASIC program you are compiling should have been saved normally to disk, not with the 'A' option. Some examples:

MEM SIZE or FILESPEC OF SOURCE? STARTMEN/BASICENTER>

MEM SIZE or FILESPEC OF SOURCE? 60000 <ENTER>

FILESPEC? CRIBBAGE/BAS

The response '60000' will protect all memory above 99999 decimal, thus preventing any machine code placed there from being overwritten.

One other facility is available at this point. The BASIC program can be read directly from the disk and not stored in RAM during compile. This will allow larger programs to be compiled. To do this use <SHIFT-ENTER> in place of <ENTER> after the filespec.

The program will be shown on the VDU as it is compiled. If an error occurs a 'message' will be displayed. Press <ENTER> to continue compilation (in order to find and note any further problems) or any other key to quit.

If the compilation is successful the prompt FILESPEC OF COMPILED PROGRAM will be displayed. Type the filespec, which should contain the extension /CMD), and <ENTER>. The program can subsequently be run by typing the program name. You will also be asked whether you wish to save the variables file to disk - see later. (answer 'N' if you are not sure)

Whenever the program is run the library (N/CMD) must always be available on one of the disk drives, although it can be removed after the program has loaded. If you type <SHIFT ENTER> in place of <ENTER> when saving the compiled program to disk, the library will be included with the program and will not be required when the program is run. It will mean however, that the compiled program will occupy around 4K more disk space.

The BASIC expected by the compiler has been made similar to LEVEL II BASIC and TRS Disk Basic with the following mainly irrelevant exceptions:

1). The following Basic words are not recognised (most are normally only used DIRECT)

TRON TROFF EDIT ERROR ERL MERGE NAME SAVE SYSTEM
CONT LIST LLIST DELETE AUTO CLOAD CSAVE PRINTL-
INPUTL-
-

RESUME line-no is accepted but RESUME and RESUME NEXT will give a syntax error

2). END STOP NEW and CMD:"\$" all have the same effect and return control to 'DOS READY'.

3). DEFINT DEFUNG DEFSTR & DEFDBL must come before any variables are used and before any Dim. statements. They should be moved to the start of your program either before compilation or after TURBO has found them for you the first time it tries to compile

4). DIM for an array must appear in the text before the array is used - we advise you to put them with any DEF's at the beginning of the program

5). DEFFN must come before the corresponding FN

6). LOAD:"filespec" will load a M/C routine for use by USB

7). RUN:"filespec" will load and run a M/C or compiled program

8). The operation of CMD:"dos-command" depends on the DOS operating system installed. It is up to the user to ensure that the command called does not overwrite parts of the program.

CMD:"D" calls DEBUG
CMD:"I" and CMD:"R" (interrupts) are recognised

9) The values of ERR will be set to the following after an error has been detected at run time and trapped by ON ERROR GOTO

- 1 INTERNAL ERROR
- 2 OVERFLOW
- 3 ARRAY INDEX ERROR
- 4 INVALID PARAMETER
- 5 OUT OF MEMORY
- 6 ERROR IN NEXT OR RETURN
- 7 STRING TOO LONG
- 8 OUT OF DATA
- 9 INVALID DATA IN INPUT/READ
- 10 FILE NOT OPEN
- 11 FILE ALREADY OPEN

- 12 WRONG FILE TYPE
- 13 READ PAST END OF FILE
- 14 UNKNOWN ERROR
- 15 OUT OF STRING SPACE

Note that the operation of the program may be unreliable after some errors have been trapped, for example OUT OF MEMORY.

- 10) The &H (hex) function is supported, but not &O (octal).

FURTHER NOTES

- 1) When ON ERROR GOTO is invoked all current FOR-NEXT loops and GOSUB RETURNS will be cleared.
- 2) CLEAR will clear the whole memory except the stack and will void any DIM statements. Any subsequent array elements found before a DIM statement will be automatically DIMed with indexes of 10.
- 3) The size of the compiled program will be greatly reduced and the speed of running increased if INT variables are used wherever possible. Use DEFINTA-Z wherever possible as this considerably speeds execution, both of the BASIC program and its compiled version.
- 4) The operation of INPUT is slightly different in that if a sequence of items is entered, separated by commas, these will be used by subsequent INPUT calls and the message E or an OPEN statement is executed any pending items in the INPUT buffer will be cleared.
- 5) PEEK and POKE work as normal, but special POKES to the communications area may not work. Also note that the compiled program will be larger than its BASIC version, so care should be taken in the placing of machine code in combined BASIC/Machine Code programs.

ERROR MESSAGES

The following error messages may occur during compilation. Compilation will pause if an error is found and a white block will appear on screen near to the error. For all errors other than OUT OF MEM, pressing ENTER will resume compilation so that the rest of the program may be checked. You will not be offered the chance to SAVE a faulty compilation.

OUT OF MEM

You have run out of RAM memory space! If you have not been spooling the program off disk during compilation, try this by pressing SHIFT ENTER after the filename when calling the BASIC program from disk.

TYPE MISMATCH

Same as BASIC1

ARRAY INDEX

You have mixed arrays - for instance the variable A has been used for DIM A(1,3) and your program has attempted to use A(X) rather than A(X,X). BASIC won't allow this either!!

DIM ERROR

A variable has either been DIMed twice or you have tried to use the array before declaring it - remember that DIM statements must be moved to the top of the program.

UNKNOWN OR MISUSED

need we say more!

BASIC WORD

As BASIC

STRING TOO LONG

As BASIC

DEF (xxx)

DEF function used before being declared.

SYNTAX ERROR

Typographical error in program listing.

INVALID LINE NUMBER (XXX) IN GOTO/GOSUB IN LINE XXX

There is a GOTO or GOSUB attempting to call a non-existent line - TURBO will ferret these out mercilessly. Routines you have tried and left lying in the middle of a program are the usual culprits.

A compiled program will always load and start running at 6A00 (hex). The run-time package loads to 5500.

VARS

Your TURBO disk also contains a program called VARS. This program can be used if the option of saving the VARS FILE is accepted at the time of saving the compiled program to disk.

Debugging a compiled program is extremely difficult normally, as the variables have all disappeared! VARS allows you to print out the values contained within the compiled program if the program 'crashes' for any reason.

After a crash, which will cause a return to DOS, type

VARS <ENTER>

and you will be offered a choice of output to printer or screen. The values printed will be those current at the time of the 'crash'.

This feature is especially useful where you may be using an unproven BASIC program compilation for speed purposes.