Seattle Computer System

Seattle Computer Products' (SCP) translation system consists of two programs: a Z80 translator (called TRANS86 on the disk, though *not* the same as Sorcim's) and a compatible 8086 cross assembler (ASM86). Both programs run on Z80 processors under CP/M-80 with a minimum of 24K bytes of RAM. The programs do not run on 8080/8085 processors.

The translator accepts source files in Zilog/Mostek mnemonics and produces an 8086 assembler source file in a form acceptable to the SCP 8086 cross assembler. Since the 8086 source format required by the SCP 8086 cross assembler is different from any other 8086 assembler that we know of, you must use these two programs together. The translator places its output on the same disk as the Z80 source code and gives it an .A86 file extension.

The translation is on an instruction-by-instruction basis with no optimization. There appears to be no limit on the file size that may be translated. Not all Z80 instructions are translated, however. Those in the following list will produce an op code error:

Cpd	Ldi
Cpi	Otdr
Ind	Otir
Indr	Outd
Ini	Outi
Inir	Rld
Ldd	Rrd

These op codes are mostly in the block-manipulation set of instructions. Although programmers do use these instructions, they must be manually coded when converting to the 8086. The SCP translator does not support macros and permits use of the following pseudo-ops only:

Db
Dm
Ds
Dw
Equ
If/Endif
Org

If the Z80 index registers IX and IY are used, they are mapped into memory locations with the labels IX: and IY:. The programmer has to define these locations; otherwise, they will show up on the assembly listing as undefined labels. The Z80 alternate register set (BC',DE',HL') is treated the same way, as memory locations that the programmer must define.

Either the DI or SI register can be used as a temporary IX register by loading one of them from the location IX when required to do indexed instructions. The programmer has to take care of this substitution; the translator does not.

When using the DI register, you must always keep in mind that the only 8086 segment base that can be used with the DI register is the ES segment; the SI register, on the other hand, can reference all the segment bases, defaulting to the DS segment. If this 8086 source code is going to be run under CP/M-86, you have to be careful about using the ES segment register. The CP/M-86 documentation specifically states that ES is not saved through a BDOS call.

For the SCP Z80-to-8086 translator's register usage, see figure 6b.

Translating the Test File

To determine how the three programs actually translate source text, we prepared a file acceptable as input to an assembler and containing all the op codes of the 8080 and Z80. Since the SCP translator could accept only Zilog/Mostek mnemonics, the test text was run through an 8080-to-Z80 filter program before the translation.

Listing 1 presents, side by side and line by line, the original 8080 code, the Sorcim TRANS86 translation, the Seattle translation, and the XLT86 translation. Here are reminders of some things to consider when you examine the translations:

- Because of the differences in the architectures of the 8086 and the 8080/Z80, some choices must be made when translating from one architecture to the other. Therefore, some difference in translation is to be expected.