8080 program counter makes relative jumps

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Although the conditional and unconditional jump commands found in the 8080's instruction set allow programs to be positioned anywhere in memory, all jumps are absolute and require specification of a 16-bit absolute address. The short routine of six instructions presented here, however, makes it easy for the program counter (PC) to make relative jumps either ahead of or behind its own starting point, adding greatly to the 8080's versatility.

By passing the desired relative displacement of the PC as a parameter through the D-E register pair, relative jumping of the PC can be effected virtually anywhere within the 64 kilobytes of available memory. The routine simply adds the contents of D-E to the current PC location stored in register pair H-L in order to bring the PC to its new location. This location is then stored in the H-L register.

The desired displacement should be expressed in 2's complement form. A positive displacement of X will cause the program to jump forward X locations from the initial PC location; a negative displacement will have the opposite effect.

When an unconditional jump is desired, the CALL instruction should be used to summon the relative-jump subroutine PCRJMP, as shown. A conditional jump (i.e. JZ, JZN, JP) can be ordered by the corresponding call instruction CZ, CNZ, or CP. □

8080 RELATIVE-JUMP SUBROUTINE	
Source statement	Comments
LXI D, DISP	; displacement in (DE)
CALL PCRJMP	; call PC relative jump routine
	; current (PC) on stack
PCRJUMP : XTHL	; current (PC) in (HL)
DAD D	; displacement added to (HL)
	; result in (HL)
XTHL	; modified (PC) on stack
RET	; modified (PC) in (PC)
	; program control transferred
	; to new area