



index register. The 6502 X register is a single-byte register, but the IX register of the Z80 has two bytes. The index registers have special functions, but they are essentially CPU RAM just like the accumulator, and here we use them as extra accumulators in which to keep the loop count. When the loop exit occurs, the contents of the 6502 X register will be stored at \$5E20. In the Z80 version the lo-byte of the (two-byte) IX register will be stored at \$5E20 and the hi-byte at \$5E21.

Thirdly, a completely new instruction has taken the place of the ADC instruction as the START of the loop: INX and INC IX are both increment instructions, causing the contents of the index register to be increased (or incremented) by \$01. This updates the value of the loop counter every time the loop is executed.

We can see the program as reading: 'make the loop counter zero, start the loop by incrementing the counter, add \$34 to the accumulator, and branch back to the start of the loop if the carry flag is clear, otherwise store the loop counter contents at \$5E20'. A further modification of the program will greatly increase its usefulness and scope:

6502		
0000	ORG	\$5DFA
5DFA	LDX	#\$00
5DFC START	STA	\$5E22,X
5DFF	INX	
5E00	ADC	#\$34
5E02	BCC	START
5E04	STX	\$5E20
5E07 EXIT	RTS	

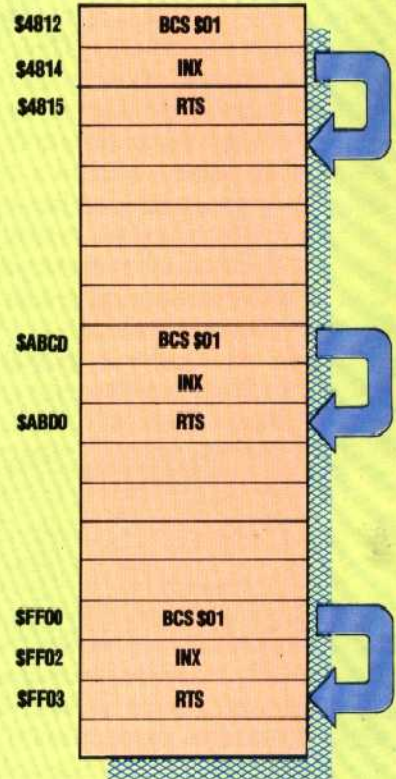
Z80		
0000	ORG	\$5DF7
5DF7	LD	IX,\$5E00
5DFB START	LD	(IX+\$22),A
5DFE	INC	IX
5E00	ADC	A,\$34
5E02	JR	NC,START
5E04	LD	(\$5E20),IX
5E08 EXIT	RET	

The 6502 and Z80 versions both have the same effect: they create at location \$5E22 a storage table of the successive values of the accumulator as the program is executed, and eventually store at \$5E20 the final value of the loop counter, which is also the number of bytes in the table starting at \$5E22.

The 6502 version achieves this through the instruction STA \$5E22,X, which means 'add the contents of the X register to the base address, \$5E22, then store the contents of the accumulator at the address thus formed'. The STA instruction is here in the absolute direct indexed mode: that is to say, the X register is used as an index to modify the base address, \$5E22. Since the X register is initialised to \$00 and subsequently incremented every iteration, the starting value of the accumulator will be stored at \$5E22, the next value at \$5E23, and so on. After the loop exit occurs, STX will store the final value of the loop counter at location \$5E20.

The Z80 version uses the IX register as a pointer to the current storage address, while still using the

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