

# DATABASE

Here, courtesy of Zilog Inc., we produce another part of the Z80 programmers' reference card.

## 16-Bit Arithmetic Group

		SOURCE					
		BC	DE	HL	SP	IX	IY
DESTINATION	ADD'	HL	09	19	29	39	
		IX	DD 09	DD 19		DD 39	DD 29
		IY	FD 09	FD 19		FD 39	FD 29
	ADD WITH CARRY AND SET FLAGS 'ADC'	HL	ED 4A	ED 5A	ED 6A	ED 7A	
	SUB WITH CARRY AND SET FLAGS 'SBC'	HL	ED 42	ED 52	ED 62	ED 72	
	INCREMENT 'INC'		03	13	23	33	DD 23
DECREMENT 'DEC'		0B	1B	2B	3B	DD 2B	FD 2B

Mnemonic	Symbolic Operation	S	Z	Flags			P/V	N	C	Opcode			Hex	No. of Bytes	No. of M Cycles	No. of T States	Comments
				H	X	V				76	543	210					
ADD HL, ss	HL ← HL + ss	•	•	X	X	X	•	0	1	00	ss1	001		1	3	11	ss Reg 00 BC
ADC HL, ss	HL ← HL + ss + CY	1	1	X	X	X	V	0	1	11	101	101	ED	2	4	15	01 DE 10 HL 11 SP
SBC HL, ss	HL ← HL - ss - CY	1	1	X	X	X	V	1	1	11	101	101	ED	2	4	15	01 ss0 010
ADD IX, pp	IX ← IX + pp	•	•	X	X	X	•	0	1	11	011	101	DD	2	4	15	pp Reg 00 BC 01 DE 10 IX 11 SP
ADD IY, rr	IY ← IY + rr	•	•	X	X	X	•	0	1	11	111	101	FD	2	4	15	rr Reg 00 BC 01 DE 10 IY 11 SP
INC ss	ss ← ss + 1	•	•	X	•	X	•	•	•	00	ss0	011		1	1	6	
INC IX	IX ← IX + 1	•	•	X	•	X	•	•	•	11	011	101	DD	2	2	10	
INC IY	IY ← IY + 1	•	•	X	•	X	•	•	•	00	100	011	23				
DEC ss	ss ← ss - 1	•	•	X	•	X	•	•	•	11	111	101	FD	2	2	10	
DEC IX	IX ← IX - 1	•	•	X	•	X	•	•	•	00	100	011	23				
DEC IY	IY ← IY - 1	•	•	X	•	X	•	•	•	00	ss1	011		1	1	6	
		•	•	X	•	X	•	•	•	11	011	101	DD	2	2	10	
		•	•	X	•	X	•	•	•	00	101	011	2B				
		•	•	X	•	X	•	•	•	11	111	101	FD	2	2	10	
		•	•	X	•	X	•	•	•	00	101	011	2B				

NOTES ss is any of the register pairs BC, DE, HL, SP  
pp is any of the register pairs BC, DE, IX, SP  
rr is any of the register pairs BC, DE, IY, SP

Flag Notation • = flag not affected, 0 = flag reset, 1 = flag set, X = flag is unknown,  
1 = flag is affected according to the result of the operation