

INSTRUCTION EXECUTION TIMES [μsec]

- Notes:-
- shift clock frequency = 10 MHz
 - start-up time (16 μs) not included
 - all execution times for situation with no I/O service request
 - to obtain execution times for instruction interrupted by I/O service request is necessary to add 1.8 μsec to execution time of given instruction

GROUP	INSTR	BESTCASE	TIME	WORSTCASE	NOTE
MEMORY REFERENCE GROUP	AD $\times$	10.6	$10.6 + 3.0 n$		n = number of levels in multiple. indirect best case = $n=0$ (direct)
	CP $\times$	11.7	$11.7 + 3.0 n$		
	LD $\times$	10.0	$10.0 + 3.0 n$		
	ST $\times$	11.3	$11.3 + 3.0 n$		
	IOR	10.0	$10.0 + 3.0 n$		
	ISZ	11.4	$11.4 + 3.0 n$		
	AND	10.0	$10.0 + 3.0 n$		
	DSZ	14.7	$14.7 + 3.0 n$		
	JSM	20.7	$20.7 + 3.0 n$		
	JMP	6.9	$6.9 + 3.0 n$		
SHIFT- ROTATE GROUP	A $\times$ R		9.8		
	S $\times$ R		8.1		
	S $\times$ L		11.5		
	R $\times$ R		8.5		
ALTER- SKIP GROUP	SZ $\times$	8.6		9.0	worst case = skip condition met best case = skip condition not met
	RZ $\times$	8.6		9.0	
	SI $\times$	10.1		10.5	
	RI $\times$	10.1		10.5	
	SL $\times$	8.5		8.9	
	S $\times$ P	9.8		10.2	
	S $\times$ M	11.4		11.8	
	SES	7.9		8.3	
	SEC	7.2		7.6	
EXECUTE- DMA- COMP- GROUP	EX $\times$		$4.8 + T_i$		T_i = progr. instr. ex. time T_m = memory time
	DMA		$12.8 + T_m$		
	CM $\times$		8.1		
	TC $\times$		9.7		

- continue -

9000 A - FIRST PROTOTYPE
INSTRUCTION EXECUTION TIMES [μSEC] - CONTINUE

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GROUP	INSTR	BEST CASE	TIME	WORST CASE	NOTE
REGISTER REFERENCE GROUP	AD*	10.9	$10.9 + 3.0n$		n = number of levels in multiple indirect $n = 0$ (direct) = = best case
	CP*	12.0	$12.0 + 3.0n$		
	LD*	10.3	$10.3 + 3.0n$		
	ST*		$11.6 + 3.0n$		
	IOR	10.3	$10.3 + 3.0n$		
	ISZ		$11.7 + 3.0n$		
	AND	10.3	$10.3 + 3.0n$		
	DSZ		$15.0 + 3.0n$		
	JSM		$21.0 + 3.0n$		
	JMP		$7.2 + 3.0n$		
I/O GROUP	STF		7.7		
	CLF		7.7		
	SFC		7.7		
	SFS		7.7		
	CLC		7.7		
	STC		7.7		
	OT*		12.5		
	LI*		12.5		
	MI*		12.5		
MAC- GROUP	RET		16.6		n = number of shifts $n = 0$ = best case $n = 11$ = worst case
	MOV		9.0		
	CLR		20.1		
	XFR		32.1		
	MRX	26.5	$26.5 + 22.9n$	278.4	
	MRY	26.5	$26.5 + 22.9n$	278.4	
	MLS		45.4		
	DRS		46.4		
	DLS		45.7		
	FXA		61.9		
	FM*	27.1	$27.1 + 42.2n$	406.9	n = multiplier digit $b.c \equiv n = 0$; $w.c \equiv n = 9$ $n = (\text{quotient} + 1)$ $b.c \equiv n = 1$; $w.c \equiv n = 10$
	FDV	61.4	$19.8 + 41.6n$	435.8	
	CMX		53.8		
	CMY		53.8		
	MDI		55.8		n = number of lead. zeros $b.c \equiv n = 0$ $w.c \equiv n = 12$
	MRM	26.5	$26.5 + 24.4n$	319.3	

Note: b.c $\equiv$ best case
w.c $\equiv$ worst case

updated = 6-24-1970
8-11-1970