

Team 45 Report

Instruction	Time	Control	Micro Operation	LOAD ACTIVATED	MEMORY Read/Write	Bux Encoder Output	ALU Encoder Output
LDA A	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D2T3	$DR \leftarrow M[AR]$	DR	read	000	
	T4	D2T4	$AC \leftarrow DR, SC \leftarrow 0$	AC	—	100	001
DIV B	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	—	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	read	111	
	T3	D0T3	$TR \leftarrow AC$	TR	—	011	
	T4	D0T4	$DR \leftarrow M[AR]$	DR	read	000	
	T5	D0T5	$AC \leftarrow DR$	AC	—	100	001
	T6	D0T6	$DR \leftarrow TR$	DR	—	101	
	T7	D0T7	$AC \leftarrow DR/AC, SC \leftarrow 0$	AC	—		101
ADD C	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D1T3	$DR \leftarrow M[AR]$	DR	read	000	
	T4	D1T4	$AC \leftarrow AC+DR, E \leftarrow \text{Cout}, SC \leftarrow 0$	AC,E	—		110
STA C	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D3T3	$M[AR] \leftarrow AC, SC \leftarrow 0$		write	011	
LDA A	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D2T3	$DR \leftarrow M[AR]$	DR	read	000	
	T4	D2T4	$AC \leftarrow DR, SC \leftarrow 0$	AC	—	100	001
MUL B	T0		$AR \leftarrow PC$	AR	—	010	

	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D5T3	$DR \leftarrow M[AR]$	DR	read	000	
	T4	D5T4	$AC \leftarrow DR * AC$	AC	—		011
ADD A	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D1T3	$DR \leftarrow M[AR]$	DR	—	000	
	T4	D1T4	$AC \leftarrow AC + DR, E \leftarrow \text{Cout}, SC \leftarrow 0$	AC, E	—		110
STA A	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	—	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D3T3	$M[AR] \leftarrow AC, SC \leftarrow 0$		write	011	
ISZ i	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D6T3	$DR \leftarrow M[AR]$	DR	read	000	
	T4	D6T4	$DR \leftarrow DR + 1$	DR	—		
	T5	D6T5	$M[AR] \leftarrow DR, \text{ if } (DR=0) \text{ then } PC \leftarrow PC+1, SC \leftarrow 0$	MR	write	100	
BUN LOP	T0		$AR \leftarrow PC$	AR	—	010	
	T1		$IR \leftarrow M[AR], PC \leftarrow PC+1$	IR	read	000	
	T2		$D0...D7 \leftarrow \text{Decode } IR(12-14), AR \leftarrow IR(0-11), I \leftarrow IR(15)$	AR	—	111	
	T3	D4T3	$PC \leftarrow AR, SC \leftarrow 0$	PC	—	001	

ALU

ALU CONTROLS	
001	$(D2T4)+(D0T5)$
011	D5T5
101	D0T7
110	D1T4