

DEUARC Control Functions and Microoperations Table

Fetch	T0 T1	$IR \leftarrow IM[PC]$ $PC \leftarrow PC+1$
Decode	T2	$D0..D15 \leftarrow IR[9..6]$, $Q \leftarrow IR[10]=1$, $S2 \leftarrow IR[1..0]$, $S1 \leftarrow IR[3..2]$, $D \leftarrow IR[5..4]$
D: Destination register selection of decoder S1: Source register selection of Mux A S2: Source register selection of Mux B		
Arithmetic and Logic Operations		
ADD	D0T3	$D \leftarrow S1+S2$, $SC \leftarrow 0$
INC	D1T3	$D \leftarrow S1+1$, $SC \leftarrow 0$
DBL	D2T3	$D \leftarrow S1+S1$, $SC \leftarrow 0$
DBT	D3T3	$D \leftarrow S1 \gg$, $SC \leftarrow 0$
NOT	D4T3	$D \leftarrow S1'1s$ (ONES COMPLEMENT)
AND	D5T3	$DR \leftarrow S1 \wedge S2$, $SC \leftarrow 0$
D: Destination register selection of decoder If $Q=0$ S1S2 is 4 bit data memory address, if $Q=1$ S1S2 is 4 bit data		
Data Transfer		
LD	D6QT3 D6Q'T3 D6Q'T4	$D \leftarrow S1S2$, $SC \leftarrow 0$ $AR \leftarrow S1S2$ $D \leftarrow DM[AR]$, $SC \leftarrow 0$
ST	D7QT3 D7Q'T3 D7Q'T4	$S2 \leftarrow D$, $SC \leftarrow 0$ $AR \leftarrow S1S2$ $DM[AR] \leftarrow D$, $SC \leftarrow 0$
TSF	D9T3	$D \leftarrow S1$, $SC \leftarrow 0$
Program Control		
CAL	D10T3 D10T4	$SM[SP] \leftarrow PC$ $PC \leftarrow IR[4..0]$, $SP \leftarrow SP+1, SC \leftarrow 0$
RET	D11T3 D11T4	$SP \leftarrow SP-1$ $PC \leftarrow SM[SP], SC \leftarrow 0$
JMP	D12Q'T3 D12QT3	$PC \leftarrow IR[4..0], SC \leftarrow 0$ IF $V=1$ THEN $PC \leftarrow IR[4..0]$, $SC \leftarrow 0$
JMR	D13T3	$PC \leftarrow PC+IR[3..0]$
PSH	D14T3 D14T4 D14T5	$AR \leftarrow IR[3..0]$ $SM[SP] \leftarrow DM[AR]$ $SP \leftarrow SP+1$
POP	D15T3 D15T4 D15T5	$AR \leftarrow IR[3..0]$ $SP \leftarrow SP-1$ $DM[AR] \leftarrow SM[SP]$