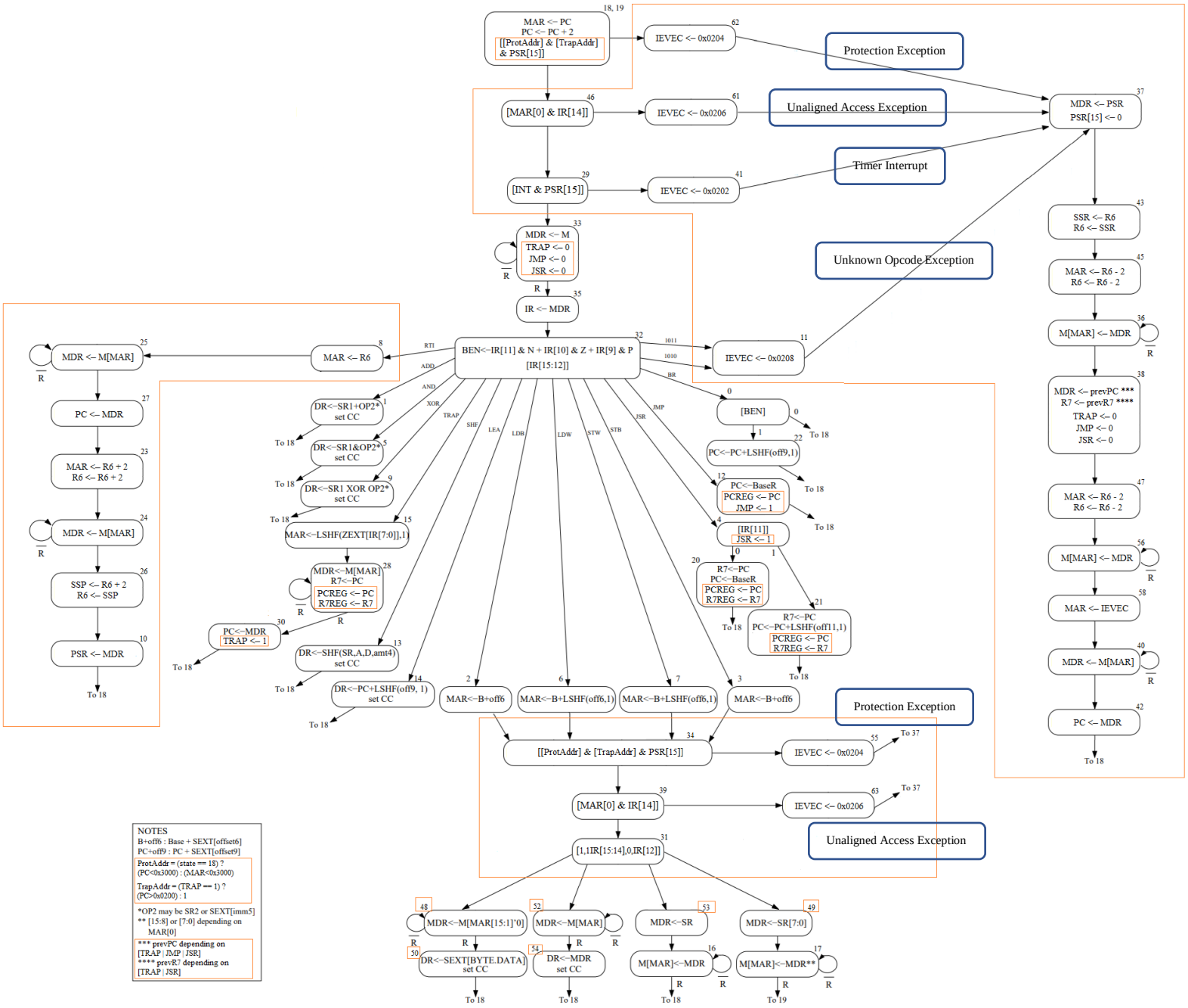
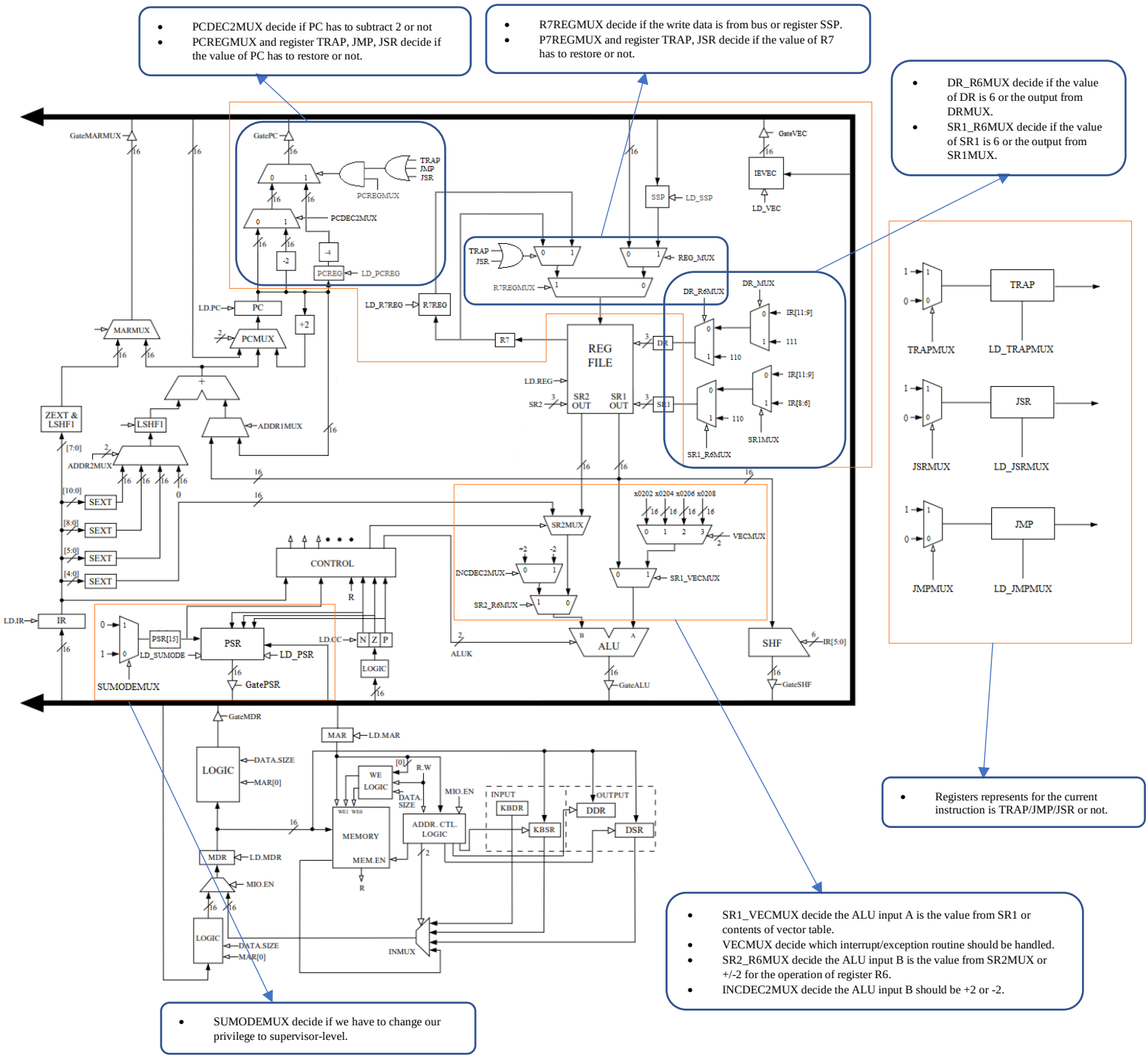
- State Diagram



- Datapath



- PCDEC2MUX decide if PC has to subtract 2 or not
- PCREGMUX and register TRAP, JMP, JSR decide if the value of PC has to restore or not.

- R7REGMUX decide if the write data is from bus or register SSP.
- P7REGMUX and register TRAP, JSR decide if the value of R7 has to restore or not.

- DR_R6MUX decide if the value of DR is 6 or the output from DRMUX.
- SR1_R6MUX decide if the value of SR1 is 6 or the output from SR1MUX.

- Registers represents for the current instruction is TRAP/JMP/JSR or not.

- SR1_VECMUX decide the ALU input A is the value from SR1 or contents of vector table.
- VECMUX decide which interrupt/exception routine should be handled.
- SR2_R6MUX decide the ALU input B is the value from SR2MUX or +/-2 for the operation of register R6.
- INCDEC2MUX decide the ALU input B should be +2 or -2.

- SUMODEMUX decide if we have to change our privilege to supervisor-level.

- Control Signals

Signal Name	Signal Values	
COND(COND2/1, COND1, COND0):	101	;select protection exception
	110	;select unaligned access
	111	;select timer interrupt
LSIRD/1:	[0,0,IR[15:12]]	
	[1,1,IR[15:14],0,IR[12]]	
LD_PSR/1:	NO, LOAD	
LD_SSP/1:	NO, LOAD	
LD_VEC/1:	NO, LOAD	
LD_SUMODE/1:	NO, LOAD	
LD_TRAP/1:	NO, LOAD	
LD_JSR/1:	NO, LOAD	
LD_JMP/1:	NO, LOAD	
LD_R7REG/1:	NO, LOAD	
LD_PCREG/1:	NO, LOAD	
GateVEC/1:	NO, YES	
GatePSR/1:	NO, YES	
PCDEC2MUX/1:	PC	;select pc
	PC - 2	;select pc – 2
DR_R6MUX/1:	DRMUX	;select output from DRMUX
	R6	;select R6
SR1_R6MUX/1:	SR1MUX	;select output from SR1MUX
	R6	;select R6
SR2_R6MUX/1:	SR2MUX	;select output from SR2MUX
	INCDEC2MUX	;select output from INCDEC2MUX
REG_MUX/1:	BUS	;select value from bus
	SSP	;select value from SSP
INCDEC2MUX/1:	+2	
	-2	
VECMUX/2:	x0202	;select timer interrupt vector
	x0204	;select protection exception vector
	x0206	;select unaligned access exception vector
	x0208	;select unknown opcode exception vector
SR1_VECMUX/1:	SR1OUT	;select SR1OUT
	VECMUX	;select output from VECMUX
SUMODEMUX/1:	1	;select PSR[15] to user mode (1)
	0	;select PSR[15] to supervisor mode (0)
TRAPMUX/1:	0	
	1	
JSRMUX/1:	0	
	1	
JMPMUX/1:	0	
	1	
R7REGMUX/1:	REG_MUX	;select output from REG_MUX
	R7MUX	;select output from R7MUX
PCREGMUX/1:	PCDEC2MUX	;select output from PCDEC2MUX
	PCREG - 4	;select output from PCREG - 4

- Microsequencer