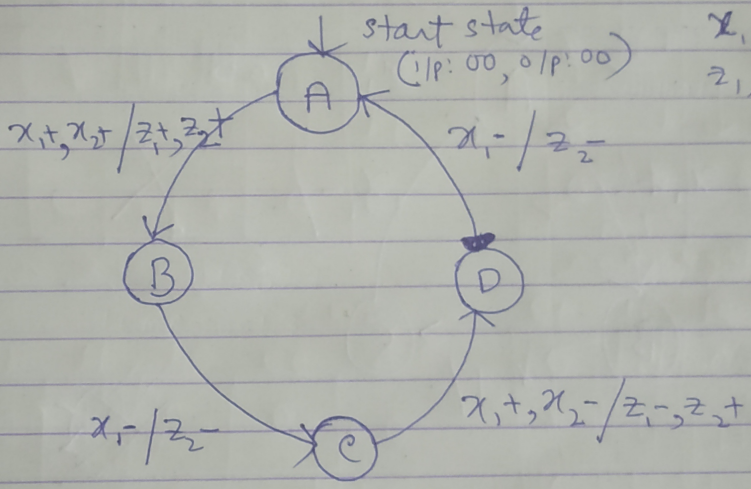
Burst mode design

SIC model is very restrictive. MIC model: multiple inputs may change value in a narrow time interval and no further input change until the machine has stabilized; also very restrictive.

Burt-mode (further generalization): Several inputs may change. All changes need not be in a narrow time interval. They can change in any order in any time (input burst) and respond with a set of output value changes (output burst).

example:



x_1, x_2: inputs
z_1, z_2: outputs

A burst mode specification must obey the following restrictions:

1. Non-empty input bursts.
2. Maximal set property: No input burst on an outgoing arc from any state must be a subset of an input burst on another outgoing arc from the same state.
3. Unique entry point. Each state must have a unique set of values through which it enters.

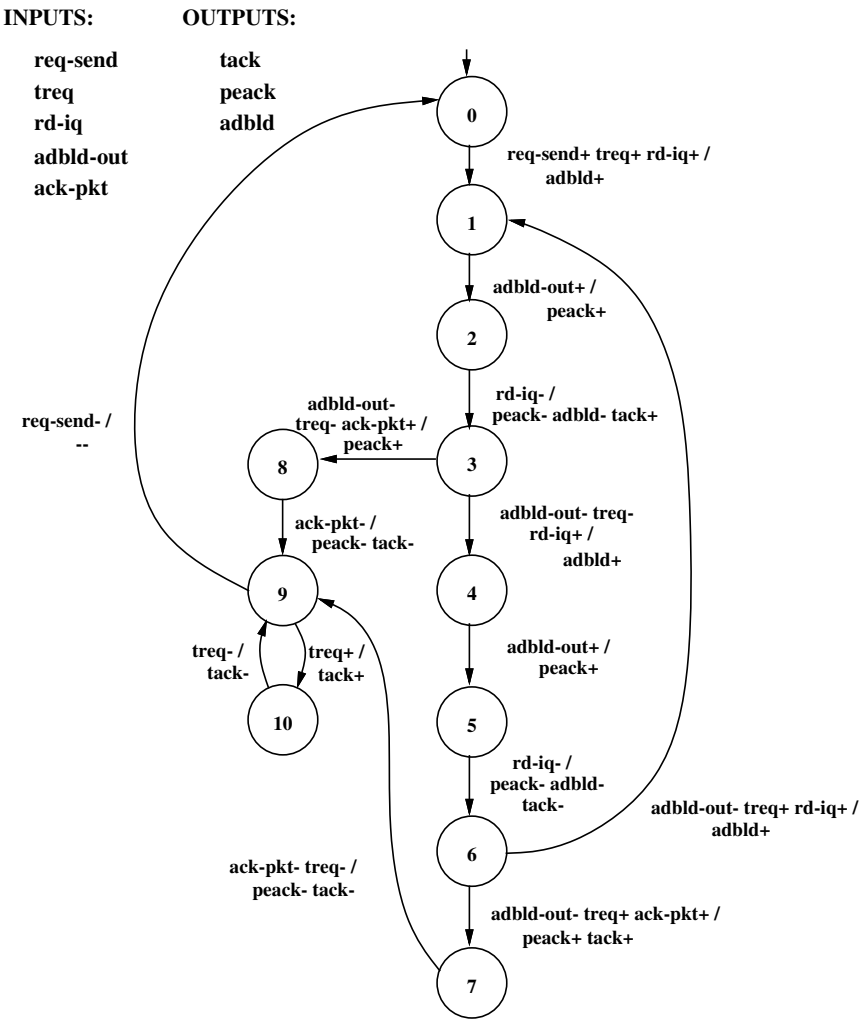
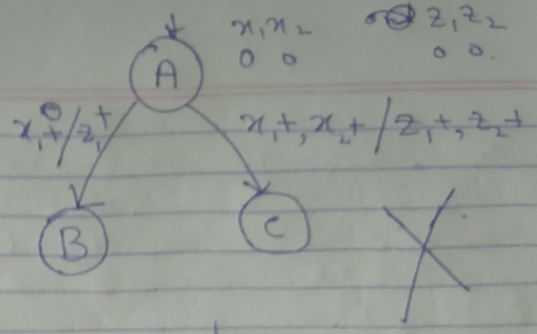


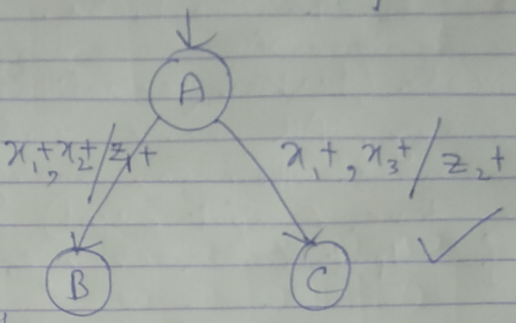
Figure 3.2: Specification for HP controller (*pe-send-ifc*).

Illustrations:

(2)

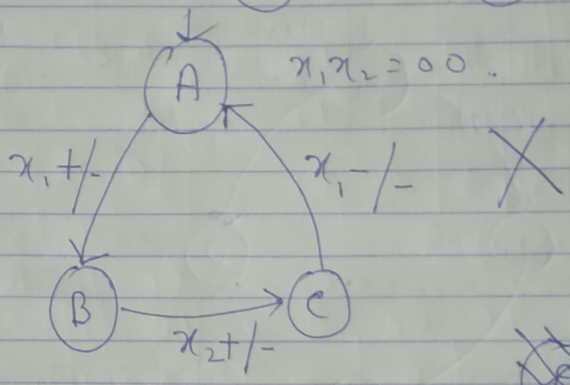


X

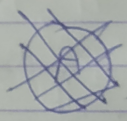


✓

(3)



X



Flow table:

States	Inputs (x_1x_2) 00	01	11	10	z_1z_2
A	A, 00	A, 00	B, 11	A, 00	x_1+, x_2+ / z_1+, z_2+
B	—	C, 10	B, 11	—	
C	C, 10	C, 10	C, 10	D, 01	
D	A, 00	—	—	D, 01	x_1-/z_2-

Hazard-free SOP realization possible.

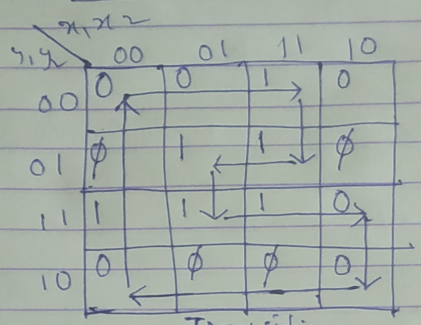
y_1y_2

A - 00
B - 01
C - 11
D - 10

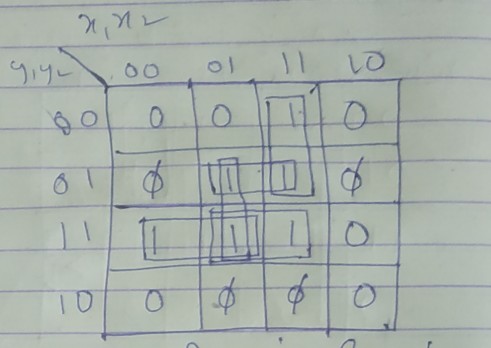
y_2 \ y_1	0	1
0	A	D
1	B	C

race-free secondary state assignment

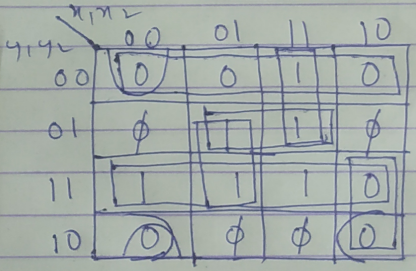
Map for Y_2:



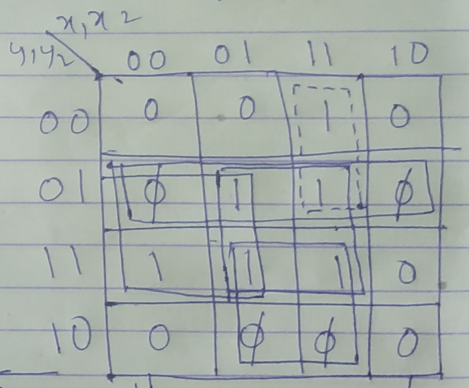
Transitions



Required cubes



Transition cubes



dhf-prime implicants ↓ \ Required cubes →	$x_1x_2y_1'$	$x_2y_1'y_2$	$x_1'x_2y_2$	$x_2y_1y_2$	$x_1'y_1y_2$
× $y_1'y_2$		✓			
x_2y_2		✓		✓	
× x_2y_1				✓	
$x_1'y_2$			✓		✓
$x_1x_2y_1'$	✓				

dhf-prime implicants

$Y_2 = x_2y_2 + x_1'y_2 + x_1x_2y_1'$