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JP-P-2002-00013902 2002 01 23 (JP)

(71) 가 가
가 가 1006

(72) 3-9-25 2-101

1-6-19

1-9-5-103

가
가 3 8-4

가 34-21

(74)

:

(54) , , ,

1 2 . 1
가 1 , 2
1 PCR PCR . 1
PCR 2 PCR 2
PCR PCR PCR

, 1 2 , , ,

2 2 1 ,

, 가 , (2) 가 , , , BML(Broadcasting Markup Language;)

ISO/IEC13818 MPEG2-TS(Moving Picture Experts Group 2-Transport Stream; 가 2 -) , DV ISO/IEC13818 MPEG2 () PES(Packetized Elementary Streams;) 64

PES Time Stamp;)가 . DTS PCR PES DTS(Decoding PCR PCR(Program Clock Reference; ,)

PCR 90kHz , PCR DTS , 가 '0' '2³³ - 1'

PES TS 188 TS

, (key station) , (main broadcasting station)

, 가 가 ,

(local station)

PCR PCR PCR PCR DTS가 PE S , PCR PCR DTS , PCR PES

[illegible]

, 1 1 1 가 , 2 1 , 1 2
 , 1 2 , 1 2
 가 , 2 1 2 .
 , 1 가 , 2 가 , 1 ,
 2 2 2 2 1 1 , ,
 , 1 , 1 2 가
 , 2 가 , 2
 2 , 2 가 2 가 , 2 ,
 , 1 가 2 1 2 , 2 (a)
 2 2 1 2 2 , (b)
 , 1 가 , 2 가 ,
 ,
 , 1 1 1 1 1
 2 , 1 1 , 1 가 1 , 2 , 1 1 1
 2 2 가 1 , 2 1
 2 1 ,
 2 2 1 2
 1 , 2 ,
 , 1 1 1 1 1 1 2
 , 1 1 , 1 가 , 2 , 1 1
 2 1 1 , 1 2 2
 2 1 2 , 1 2 1 2
 2 1 가 , 2 1 1 2
 2 1 2 .
 , 1 1 2 ,
 2 1 () 1 1 ,

() 1 , () 1 가
 , 0 1 2 , 1 '0' , 1 2 1
 1 가 2 , 1 2 1
 1 2 1
 , 2 , 1
 , , 가 2 3 2 가
 , 2 2 , (a) 3 가 , (b) 2
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 , 가
 , .
 , 1 2 1
 , 1 , 1 1
 , 1 1 1 1 1 1 가 1 3
 , 1 3 , (a) 3 3
 , (b) 1 , 2 2 2 2
 , 2 2 2 2 1
 가 , 2 1 2 1
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 (old) ,
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 , 1 1 , 가 1 1
 1 , 1 1 1
 , 2 , 2 2 2
 , 2 가 2 2 , 1 2
 2 2 (a) 1 2
 (b) 2 .
 , 가 , 가 ,
 .
 , 1 1 1 1
 가 1 1 ,
 가 1 2 2 1

2 , 1 2 .

가 , , .

1 1 1

가 1 1 ,

가 1 2 2 , 1

2 , 1 2 .

가 , , .

1 1 1 1 가

가 1 1 2 , 1 2

2 , 1 2 .

가 1 2 2 , 1 2

2 , ,

가 1 1 1 1

가 1 1 1 1

가 1 2 2 , 1 2

2 , 1 2

가 1 2 2 , 1 2

1 1 .

2 1 .

3 1 PES .

4 .

	1	2	PES
5			
6			
7			
8			
9	1		
10	2		
11	2		
12	1	(10)	(14)
13	2		
14	3		
15	3		
16	3		
17	4		
18	4		
19	4		
20	5		
21	5	(0)	
22	5		
23	6		

1
MPEG2-TS 6 가 . , ISO/IEC13818
1 2 ,
(1)
1 , (b) 가 , (a) 가 , (c) 5
1
1 (1) 1 (10) 2
(20) 1 (10)
2 (20) 1 (10)

20)가 2 (20) , 1 (10) 2 (

(1) CPU, ROM, RAM, , CPU가

ROM 2 5

1 (10) (11), (12), PCR (13), (14)

(15)

(11) (a) , DV

(b) (20) (21) (12)

(12) (a) MPEG2 PES , (b)

PES DTS PCR , (c) PES TS

. TS (15)

PCR (13) 90kHz '0' '2³³ - 1' PC

R (12) (14) . PCR

PCR (13)

(14)

, BML , (a)

가 (b) 가

STCR(System Time Clock Reference;) STCR PCR

(13) PCR 가 , STCR PCR TS

TS DSM-CC(Digital Storage Media Command and Control;)

(15) , TS 2 (20)

(15) (12) (14) TS

TS

2 2 (21), PCR (22), (23)

(24)

(21) 1 (10) (12)

PCR (22) 1 (10) PCR (13) , PCR (13)

, PCR (22)

(24) (21) (23) TS

(23) 1 (10) (14)

CR PCR (23) P

2 (23)

(201), (202), PCR (23) CPU (204)

(205) (23)

CPU 2 6

(201) 1 (10) (14)

(201) (202)

(202) (201) PCR PCR PCR (203)

(202) PCR (203) PCR (202) PCR PCR (203) PCR P

d0 CR 가 (204) PCR (203) PCR (203) PCR P

PCR (204) PCR PCR (203) PCR

(205) PCR (24)

1

3 1 (10) (12) PES PES (300) PES PES DTS PCR PES

PES / 3 , PES(301, 302, 303)

4 1 (10) (14) (section)

(400) TS

(401) PCR = 100 NPT = 0 NPT(Normal Pla

y Time;) PCR ,

(402) NPT = 200

5 1 (10) (15) (500) TS

, PES (500) 1 (10) , PES 5

(500)

PES PES

PCR ,

PCR PES

1 (10) 2 (20)

1 (10) 2 (20) (21) PES가

6 (21) PES (600) PES

PES PCR 2 TS (20) PCR (22) PCR 1 PES (10)

(12) PES(601, 602, 603) 1500, 1600 1700 PCR (600)

1 (10) 2 (20) (23)

7 TS

PCR 7 100

1500 (701)

8 2 (20) (24) (800) (20) PCR (22)

(800) , PCR

PCR PES

1

1 (23)

9 1

2 (23) (202)가 (201)

(202) S1 'Yes' PCR (203)

d0 가 , 'X mod 2³³' PCR (203) (modular multiplication)

X 가 PCR (204)

d0 PCR (13) PCR (22) PCR PCR (S2).

S2가 , PCR S1 PCR PCR (204)

2 (23) (202)가 4 (401)

PCR (203) PCR PCR (203) d

0 가 . d0 = 1500 , 가 1500 + 100 = 1600 . PCR (203) '16

00 mod 2³³' , PCR (204) PCR '200' (401) PCR PCR (204) '1600'

(2)

2 1 가 , (a) 가 , (b)

가 2 , 1 (c) 5

2 1 1 PCR 2 d

PCR PCR PCR 가 PCR d0 PCR d

1 PCR d1 가 PCR PCR PCR

2

10 (2) PCR (13) PCR PCR

2 (30) (33)가 PCR (32) PCR

1 (1)

11 (33)

(1102) PCR (1101) PCR PCR (1104) PCR

(1102) PCR (1102) PCR PCR (1104) PCR

(1104) PCR PCR

PCR (1103) PCR (32) PCR PCR

(1104) PCR PCR

PCR d1 (1104) (1102) d1 PCR PCR (1103) PCR

(1105) PCR 가 PCR (1104) d1 (1102) PCR PCR

2

1 PCR .
 12 1 (10) PCR (14) (1201) (1203) PCR
 (1201, 1203) (1200) (1202, 1204)

2

2 (33)
 , 13 2
 , 11 (33) , (1102)가 (1101)
 (1102) PCR (, PCR (1103) 'Yes'), PCR (1104)
 , d1 (PCR S12). PCR d1
 PCR (S11 'No'), S13
 S13 , d1 (S13 'Yes')
 S14 , (S13 'No') S11
 (1102)가 (S14 'Yes'), PCR (1104) (1102)
 PCR (1102) PCR 'P2 + d1'
 d1 가 , 'X mod 2³³'
 , X 가 PCR (1104)
 (1105) PCR (1105) PCR PCR
 (S15) S11 PCR
 (1102)가 (S14 'No'), S11
 , 11 (33) , PCR (1104)가 12 (120
 1) PCR(=0) PCR (1103) PCR '5000' PCR
 (1104) d1 '5000' PCR(100) d1(5000) 가 , '5100 mod 2³³' PCR '100'
 , PCR (1104) '5100' 가 PCR (1104) (5100)
 PCR PCR (1105) PCR , PCR (1105) PC
 R(100) PCR(5100)
 (3)
 3 1
 가 3 , 1 가 , (a) 가 , (b)
 , (c) 5
 3 , 2 가
 , 3 PCR
 , PCR PCR , '0' NPT PCR
 CR , 3 PCR PCR '0' NPT P
 PCR PCR d , 3
 PCR d '0' NPT 2 가 1

3

14 (3) 2 (40) (45)
)가 1 (1) .
 (45)
 5
 (43)
 15 (43)
 (1502) (1501)
 (1502)가 , (1502) NPT PCR
 , PCR NPT PCR (1505)
 PCR (1503) PCR (42) PCR , PCR PCR
 (1505)
 (1504) (45)
 , PCR (1505)
 PCR (1505) (a) N
 (, N PCR (1503) PCR N PCR
 , PCR , (b) (1502) PCR
 NPT가 '0' PCR PCR PCR (1506) 'P3 - P2' (P3
 PCR , P2 '0' NPT (1502) PCR ('0'),
 d , (c) PCR 가 NPT '0' P
 CR PCR (1506) PCR
 3
 3 (43)
 16 3 가 5 가
 , 15 (43) , (1504)가 (1504)가 (15
 04) (S21 'Yes'), PCR (1505)가 PCR 5 PCR (15
 PCR PCR PCR (S22) S22 PCR S23
 , MPEG2 PCR 1/90000 '1' 가 , 5 PCR
 가 90000 × 5 = 450000 PCR (1505)가 PCR
 PCR (1503) PCR '100' , PCR 100 + 450000 = 450
 100
 (1504)가 (S21 'No'),
 S25
 (1502)가 NPT = 0 (S23 'Yes'),
 S24 PCR (1505)가 'P3 - P2' , P3 PCR
 P2 '0' NPT PCR (1506) PCR (1506) PCR d ,
 NPT PCR PCR (1506) PCR (S24). , '0'
 d가 S25 (S25 'Yes'), S26
 d가 S25 (S25 'No'), S21
 S26 , (1502)가 (S26 'Yes'), S2
 7 PCR (1505)가 PCR d 가 P
 CR , PCR PCR (1506) . PCR (1506) PCR ,

PCR PCR (S27). , S21 .

S26 , (1502)가 (S26 'No'),
S21 .

(4)

4 1
가 . 4 , 1 가 , (a) 가 , (b)
가 , (c) 5 .

4 2 1 PCR
PCR PCR . 2 , PCR
PCR , 2 () PCR 2 PCR
PCR, () PCR, () PCR 2 ()
d2 , PCR, () d2, () PCR
PCR PCR .

4

17 (4) 2 (50) (53)가 PCR (13)
PCR PCR 1 (1) , PCR (52) PCR

18 (53) .

PCR (1801) PCR (13) PCR . PCR (1801)
PCR PCR (1803) .

PCR (1802) PCR (52) PCR . PCR (1802)
PCR PCR (1803) .

(1805) PCR (1801) . ()
1805) PCR PCR (1803) .

PCR (1803) (a) () PCR PCR (1801) PCR (1802)
) PCR, () PCR, () PCR
'a' d2 , d2 , (b) () (1805)
PCR, () d2, ()
'b' PCR PCR

PCR (1806) .

4

4 (53)
19 4 .

18 (53) , PCR (1801)가 PCR(P4) (S3
1 'Yes'), S32 , PCR (1803)가 (a) P4 (b) PCR (1801)가 P
4 PCR (52) PCR(P5) (S32). , S33
, PCR (1803)가 'P5 - P4 - a' d2 , 'a'
PCR PCR
d2 (S33). , S34 .

PCR (1801)가 PCR(P4) (S31 'No'), S34

S34 , d2가 (S34 'Yes'), S35 S
34 , d2가 (S34 'No'), S31 . S

S35 , (1805)가 S36 , PCR (1803)가 (1805) PCR(P6) S35
'Yes'), 'P6 + d2 + b' , 'd2' , 'b' , 'X mod 2³³' , 'X
가 PCR PCR PCR (1806) PCR (1806
) PCR PCR (S36). , S31 .

S35 , (1805)가 (S35
S35 'No'), S31 .

(53) PCR 'a' 'b' (, 1
00 , 1100) PCR (13) 100 PCR (53)가 PCR (52) 1600 PCR
= 1400 , PCR , d2 1600 - 100 - 100

(1805)가 100 PCR(P6) , PCR (1803) (1
805) P6 'P6 + d2 + b' 1000 + 1400 + 1100 = 3500
PCR (1803) '3500 mod 2³³' 가 PCR PCR
(1806) PCR (1806) PCR(100) PCR(3500) .

(5)

5 4
5 , (a) 가 (b) 가

5 2 가 가 ,
'가 2 PCR 0- (0-obit process)가

, PCR '0' '2³³ - 1' PCR () , '2³³ - 1'
0 '0' 가 PCR , PCR
1 2 2 PCR 2 4 ,
가 PCR , X 가 PCR 'X mod 2³³'
가 PCR , 가 2 PCR

5

5 17 4 .

20 (2000) (2000)
(2004) 18 4 (2004)
4 .

(2004) PCR , PCR (2003)
PCR (2003) PCR (2003)

PCR (2003) (a) PCR (2002) PCR(P4) , P4 PCR (2002)
PCR(P5) , 가 P5 > P4 '2³³ - P5' (2004)

, (b) 'P5 - P4' PCR d3 PCR , (c) d3 (2006)
 , (d) (2004) PC
 R PCR (2007) .

5

5 (2000) 4 . 21
 .
 (2000) , PCR (2001)가 PCR(P4) (S41 'Yes'),
 PCR(P5) S42 (, PCR (2003)가 P4가 PCr (S41 (52)
 (S42). , PCR (2003) P4 P5 .
 P5 > P4 (S43 'Yes'), S44 , PCR (2003)가 '2³³ -
 P5' (2004) (S44).
 P5 > P4 (S43 'No'), S41 .
 PCR (2003)가 (2004) 가 (S45 'Yes'),
 S46 (2003)가 (2004) , 가 . , (S41 S45 'No'), PCR
 (2003)가 (2004) 가 (S45 'No'),

. 22

(2004) 가 , PCR (2003) 'n1 + 233 - (P6 + P5 - P4) x i'
 , 'P6' 가 PCR , 'n1' NPT
 , 'i' NPT 가 , 'P4' PCR (2001) PCR , 'P5' P
 CR (52) PCR (S51).
 PCR (2003) 'PCR = 0, NPT = n2, NPT 가 = i'
 가 (S52).

가 , 2 가 , 가
 가 가 .
 (6)

6 1
 , 6 , (a) 가 , (b) 5 ,

6 , 2 가 (a) 1 2 가 PCR , (b) PCR
 . 1 2 PCR , 가 PCR PCR

6

23 (6) 1 (80)가 (86) 가
 1 (1) . , (86)

R , (86) (82)가 (84) PCR PCR PC .

6

(86) PCR PCR 가 , (82)가 PCR PCR .

PCR , PCR PCR .

PCR '0.5 × 90000 = 45000' , PCR '100' PCR '100 + 45000 = 45100' .

(93) 1 (23) PCR , 1 (93) (91)가 (23) .

(93) PCR (a) (91)가 PCR (92) 가 PCR , (b) PCR , (83) PCR PCR .

PCR (83) PCR (92) '400' , PCR '0. 0.3 , PCR (83) PCR '100' , PCR '400 + 100 + 27000 = 27500' . 3 × 90000 = 27000' , PCR '400 + 100 + 27000 = 27500' .

1 6 . , 가 .

(1) 2 PCR , PCR (23)가 PCR (32) PCR PCR PCR d1 (32) .

(2) 3 , PCR (43) , PCR (45) , -Q(net-Q)' .

(3) 3 , (43) 2 (40) (43) (, 1 (45)) . , , .

(4) MPEG2-TS , , MPEG2-TS , 가 .

(5) , , , .

(6) 9, 13, 16, 19, 21 22) (, .

IC , , (flexible disc) ROM .

가

가

(57)

1.

1 2 , 1 2 , ,
가 , ,
1 ,
1 1 1 , 1
1 , 1 1
1 , 1 , 가 1
1 1 , 1
1 1 , 1
1 1 ,
2 ,
2 2 2 ,
2 2 , 1 2 ,
2 2 , 2 1 2 ,
1 , 가 2 2 ,
(a) 1 2 (b) 2 2
2

2.

1 ,
1 1 가 ,
2 ,
1 2 가 ,
2 1 1 2
1 1 2

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(a)

, (b)

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1 2 , () 1 가 , 0
'0'
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1 ,
1 2 1 가 ,
2 ,
1 1 1 2
2 ,
2 2 1 ,
2 ,
, 1
, 가 2 2 , 1
3 3 가 ,
2 (a) 3 가 , (b) 2
2 .

9.
1 ,
1 2 ,
1 1 1 ,
1 ,
1 1 1 ,
1 1 1 가 3
1 3 가 ,
1 (a) 3 , (b) 1
1 ,
2 ,
2 2 2 ,
1 2 가 ,
2 , 1 2 , 1
1 1 2
.

10.
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1 , 1 1
 1 , 1 1
 2 2 ,
 2 , 2
 1 , 가 2 2
 , 2

(a) 1 2 (b) 2
 2 .

11.

1 1 1 1 가
 1 1 ,
 1 1 ,
 1 가 2 2 ,
 1 2
 1 2 .

12.

1 1 1 1 가
 1 1 ,
 1 1 ,
 1 가 2 2 ,
 1 2
 1 2 .

13.

1 ,
 ,
 1 1 1 1 가
 1 1 ,
 1 ,
 1 가 2 2 ,
 2

1 2

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14.

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1 1 1 1 가

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1

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1 2 가 2 2

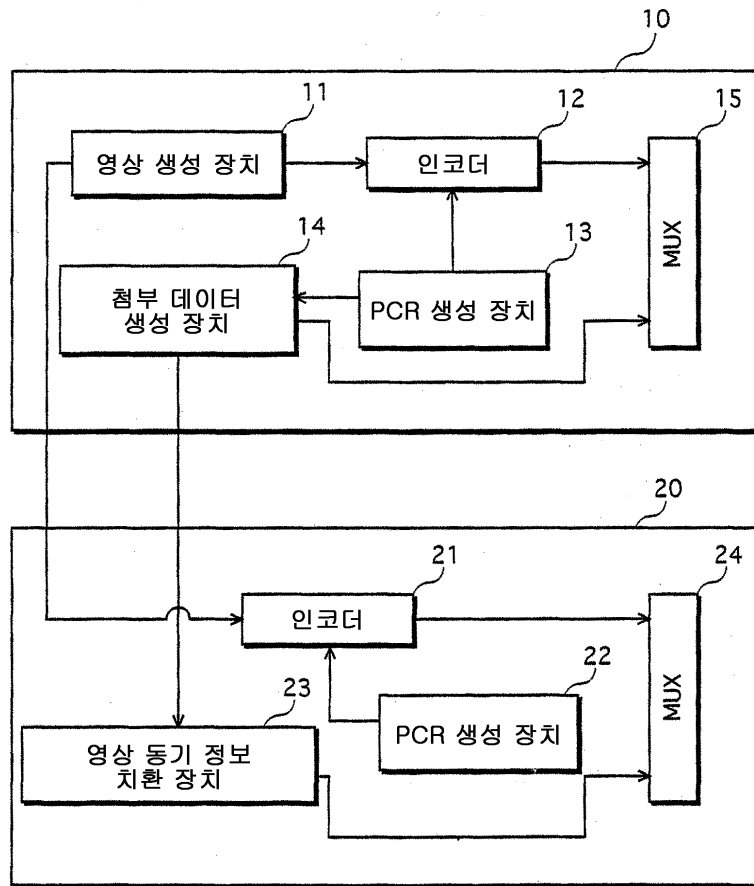
2

,

1 2

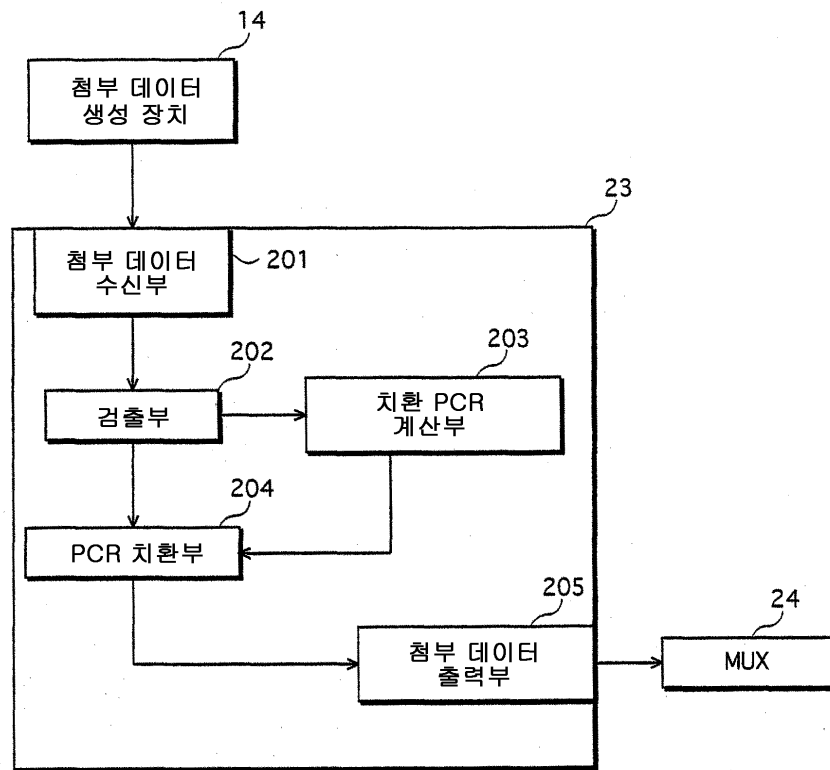
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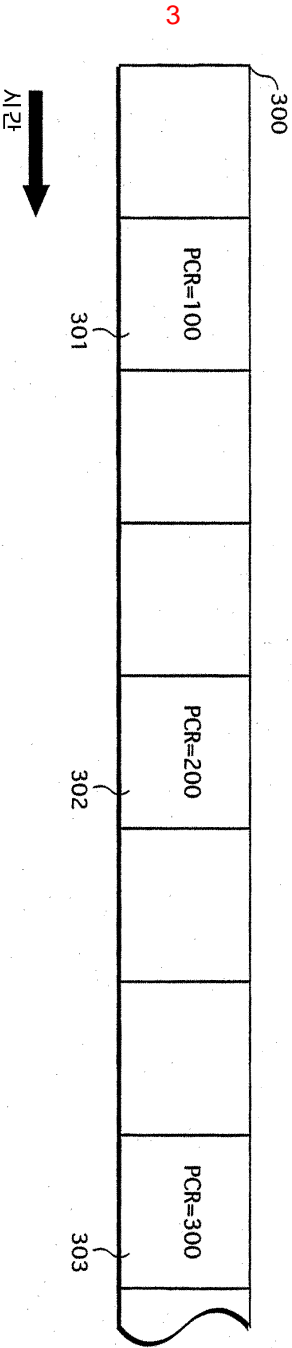
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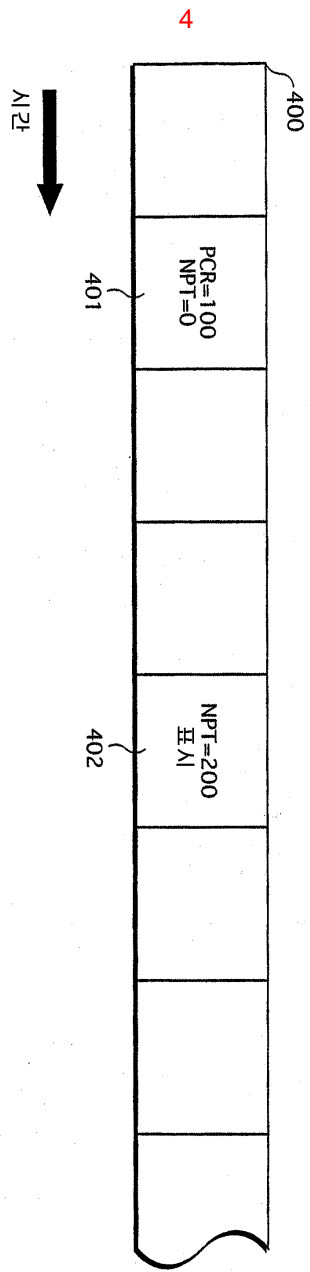


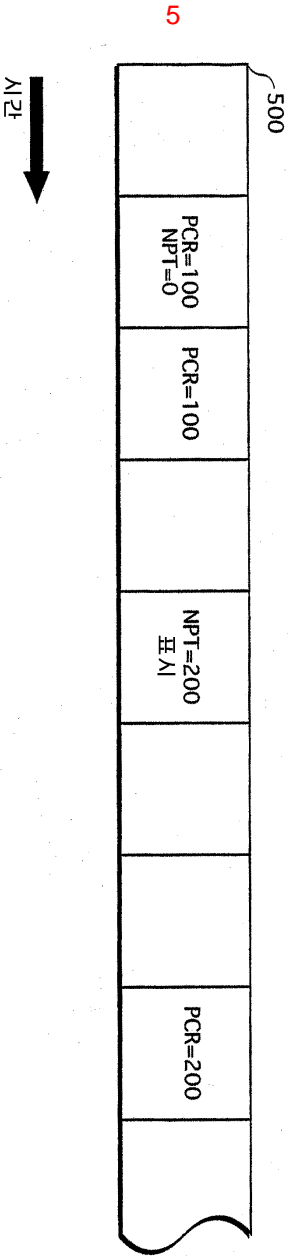
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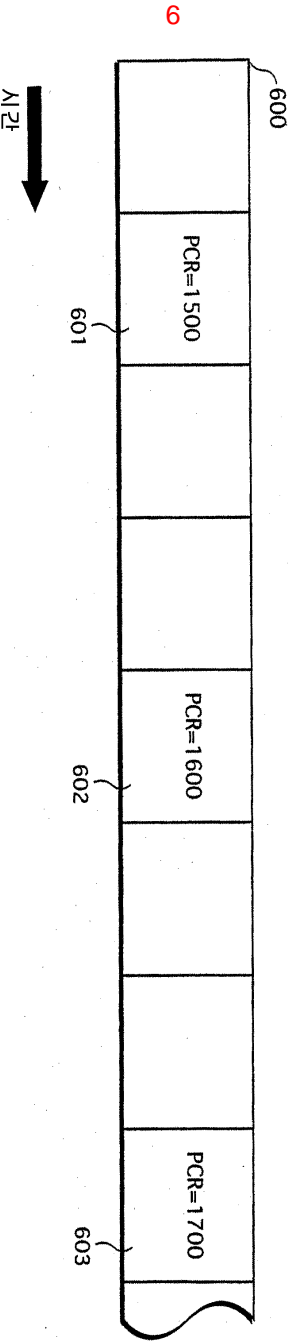
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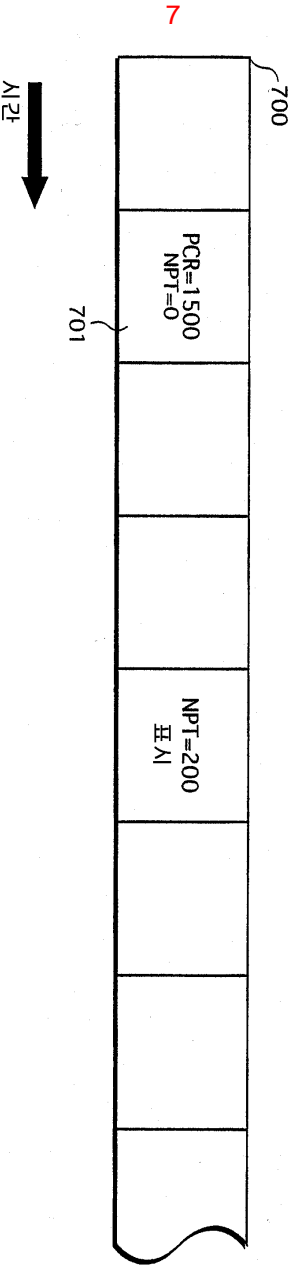


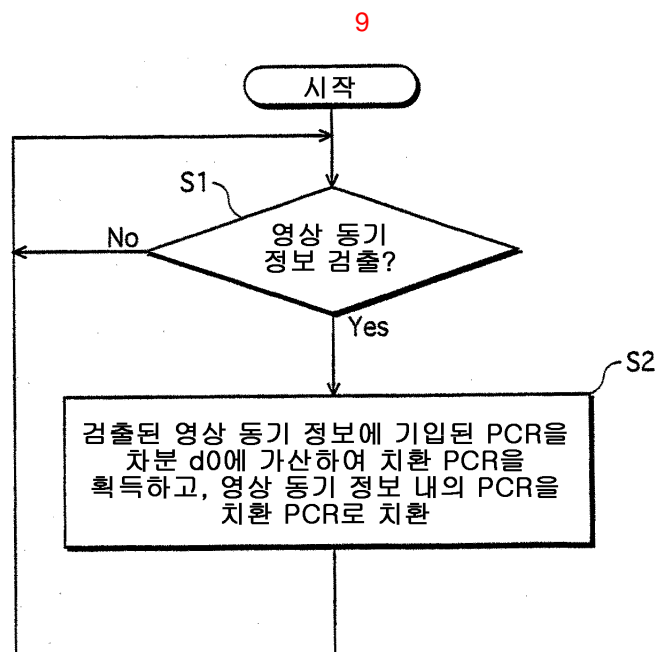
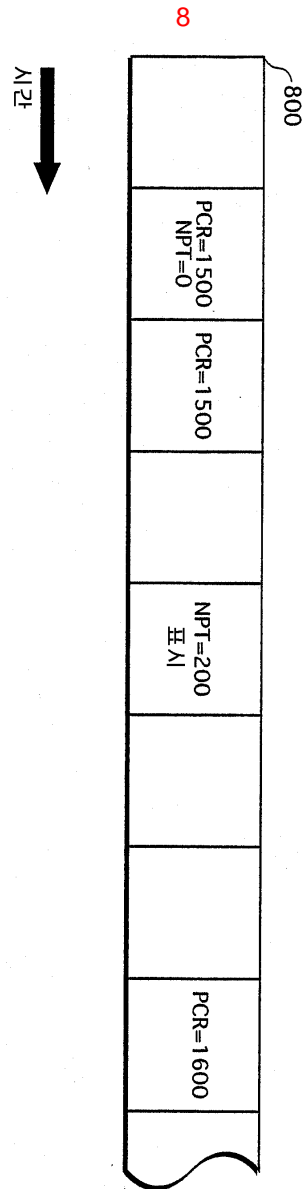




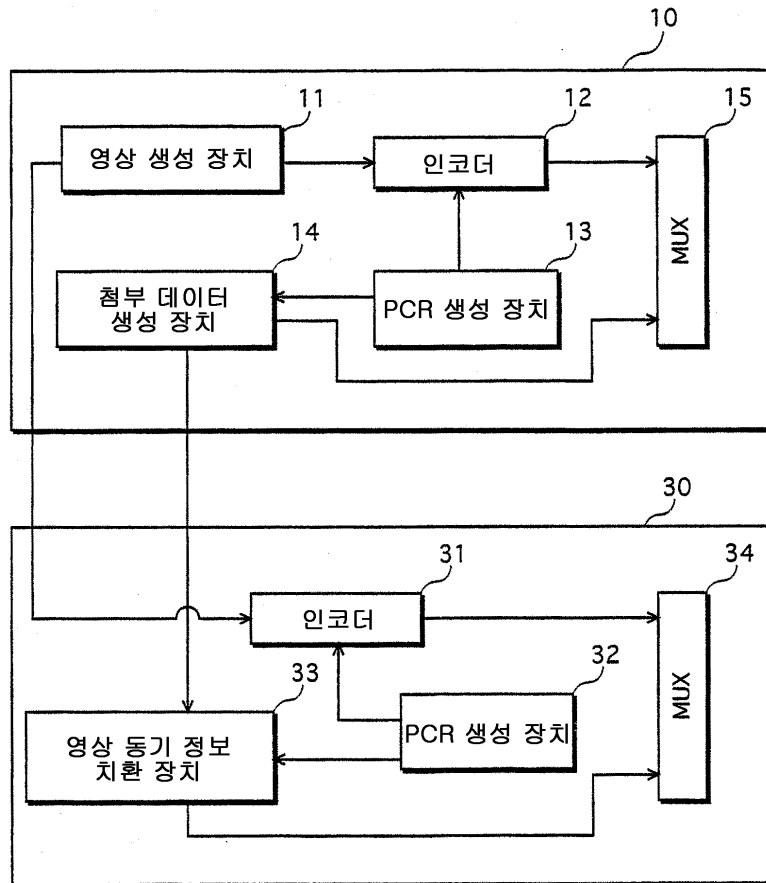






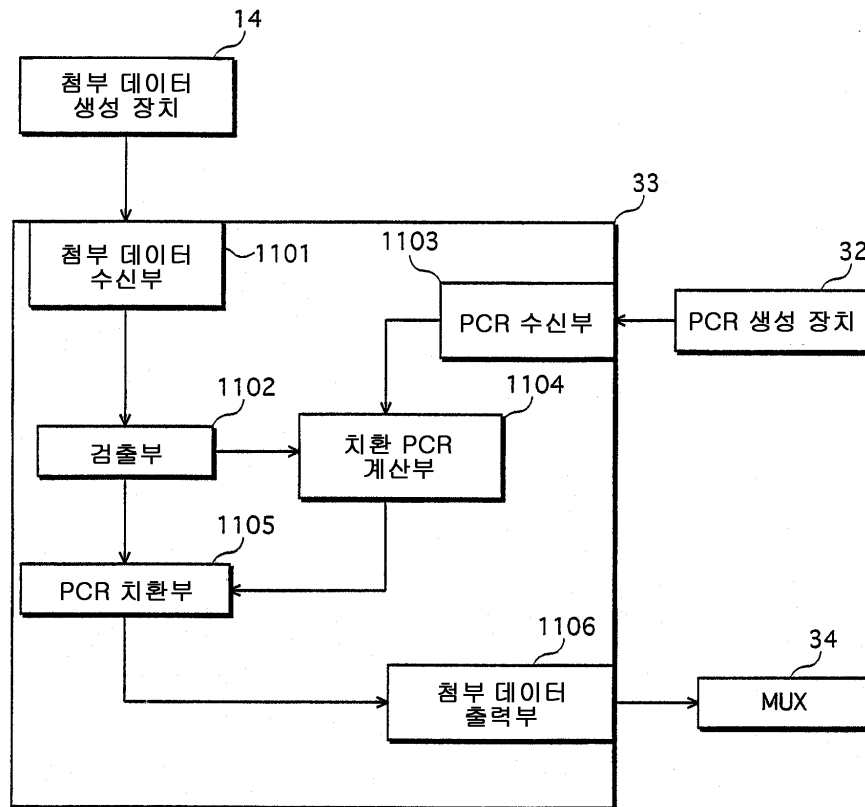


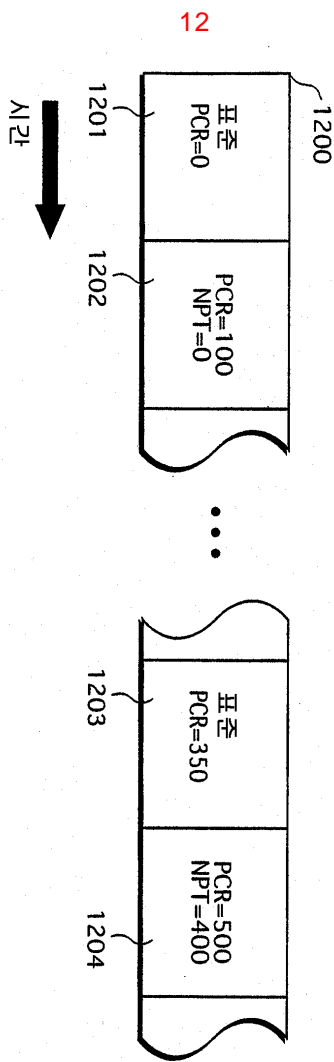
10



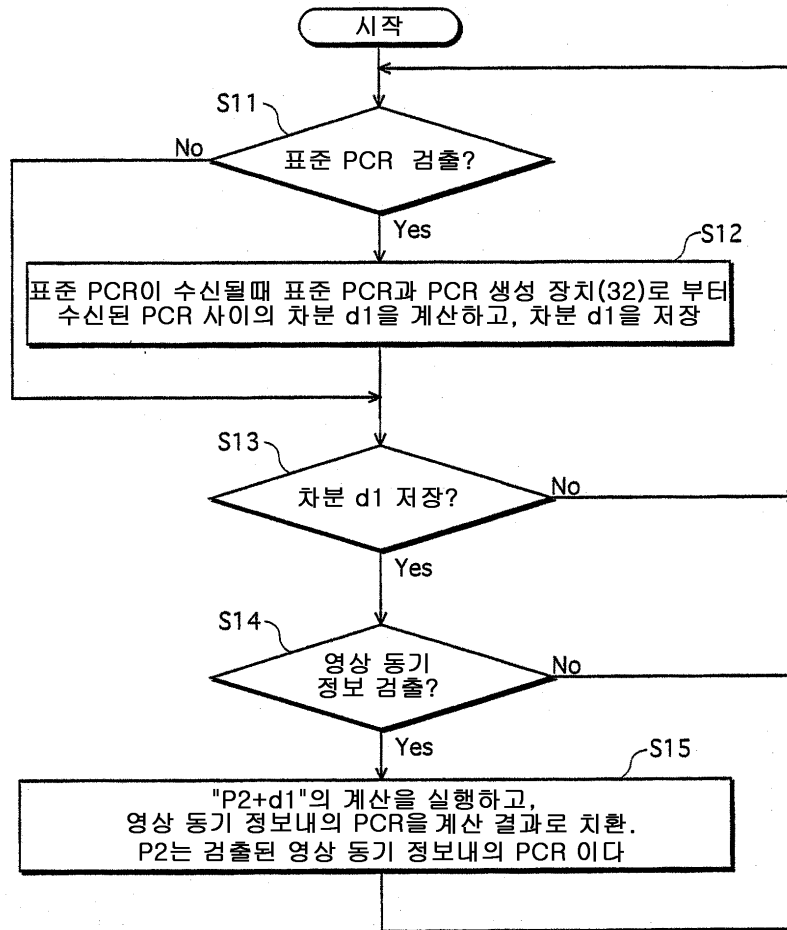
2

11

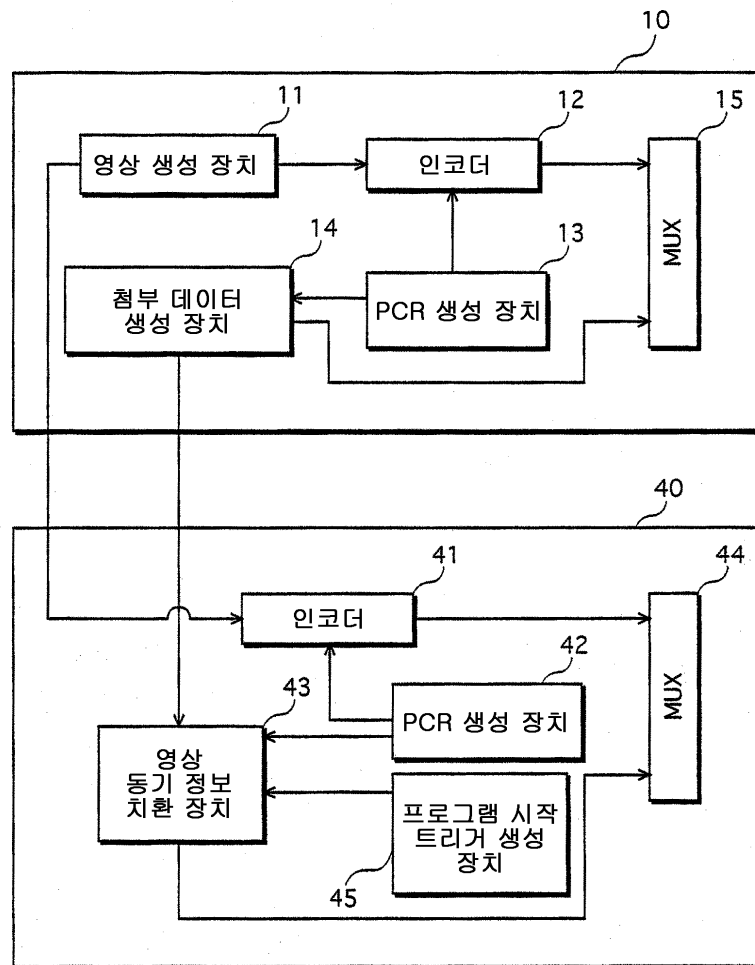




13

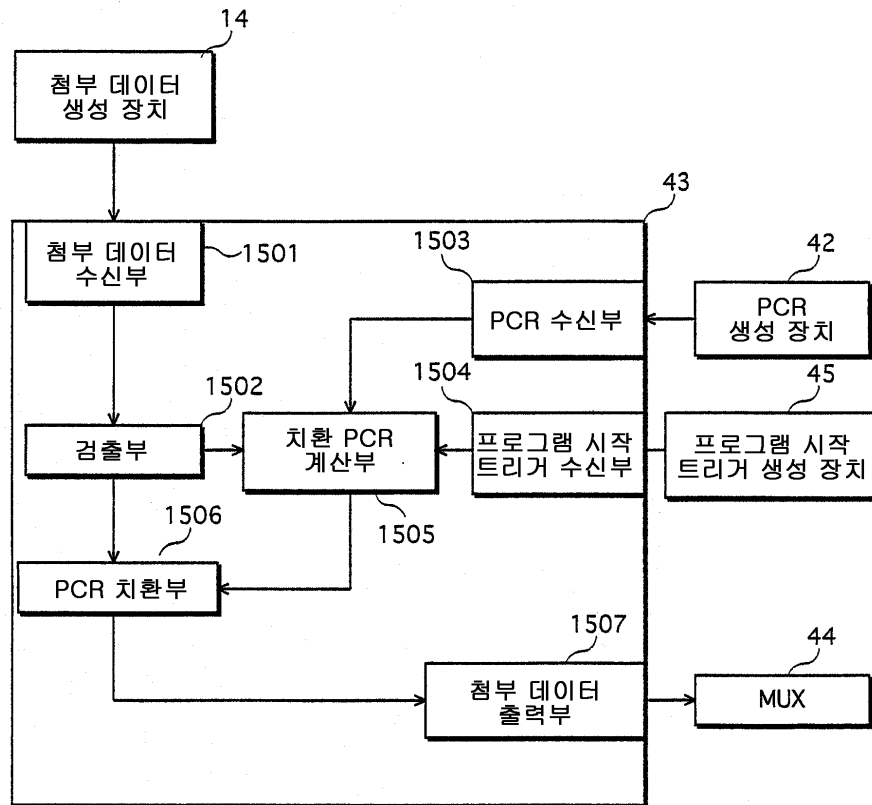


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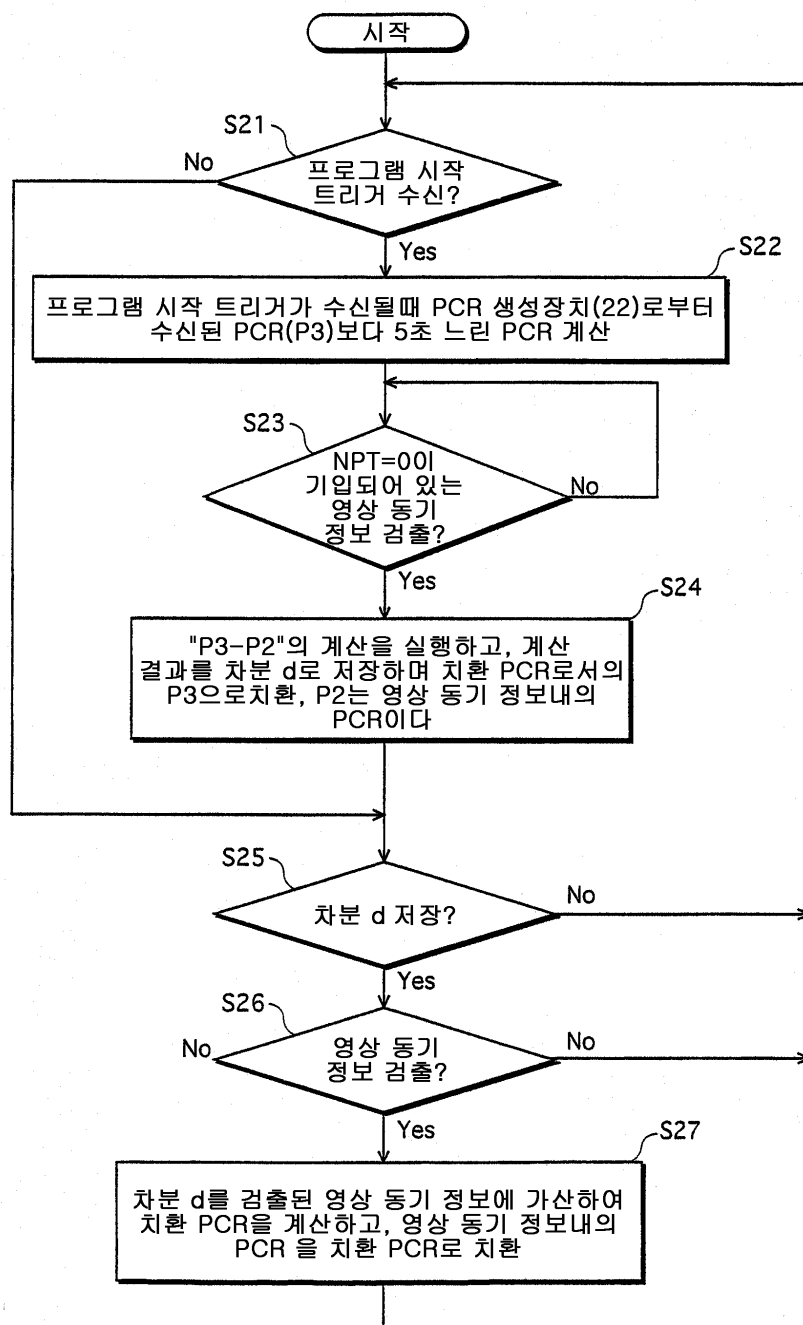


↑
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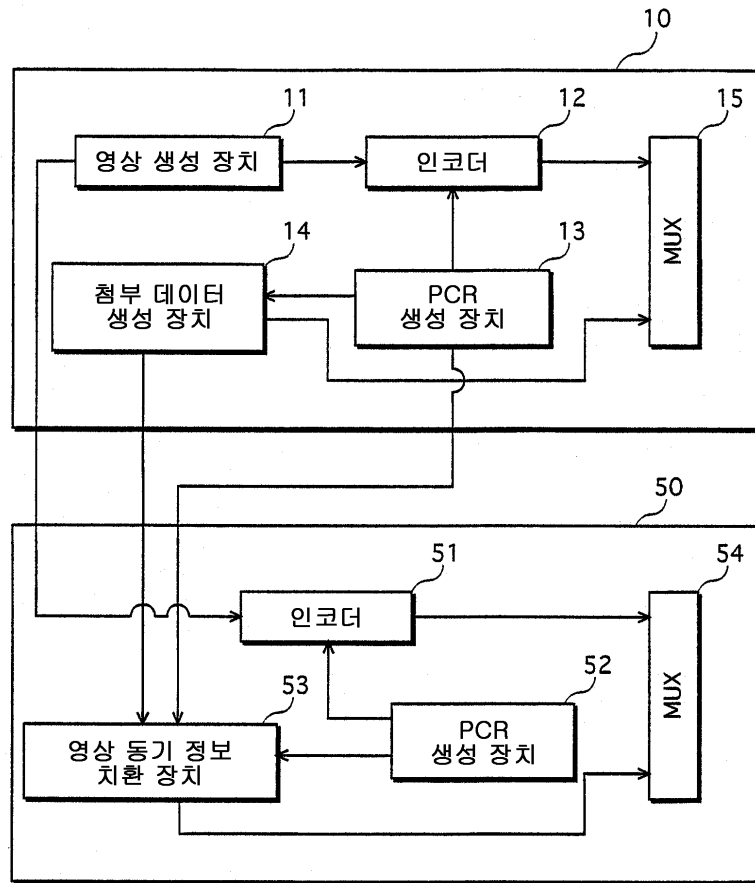
15



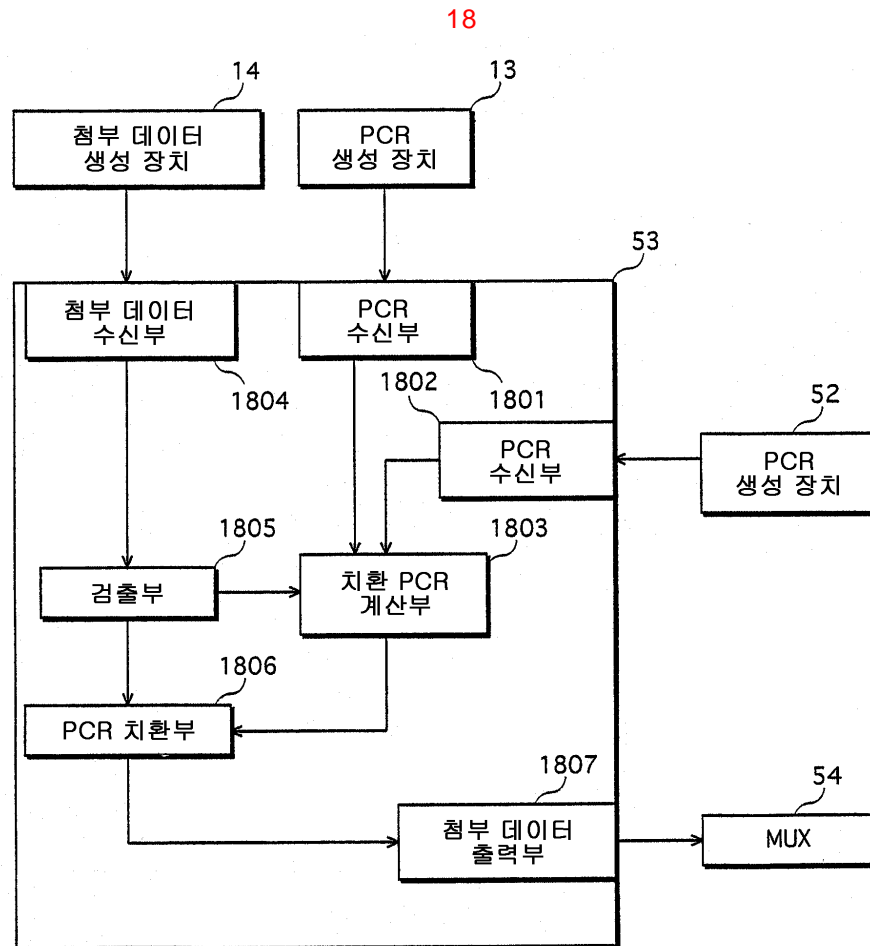
16



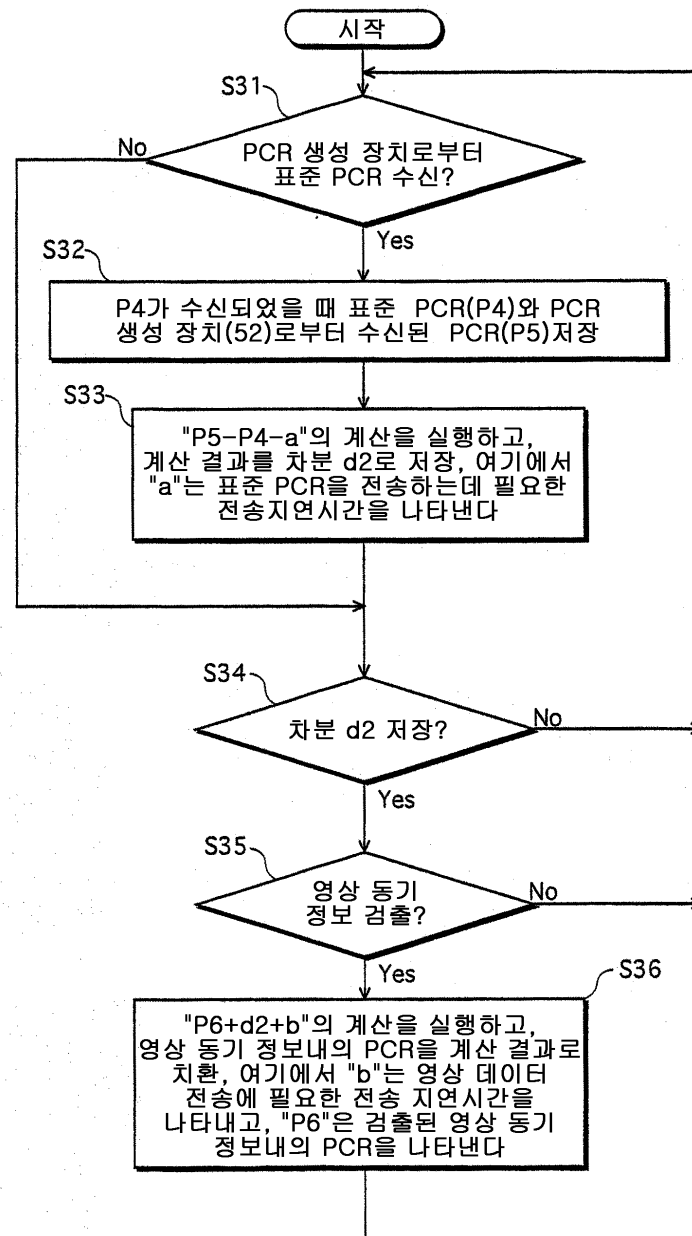
17

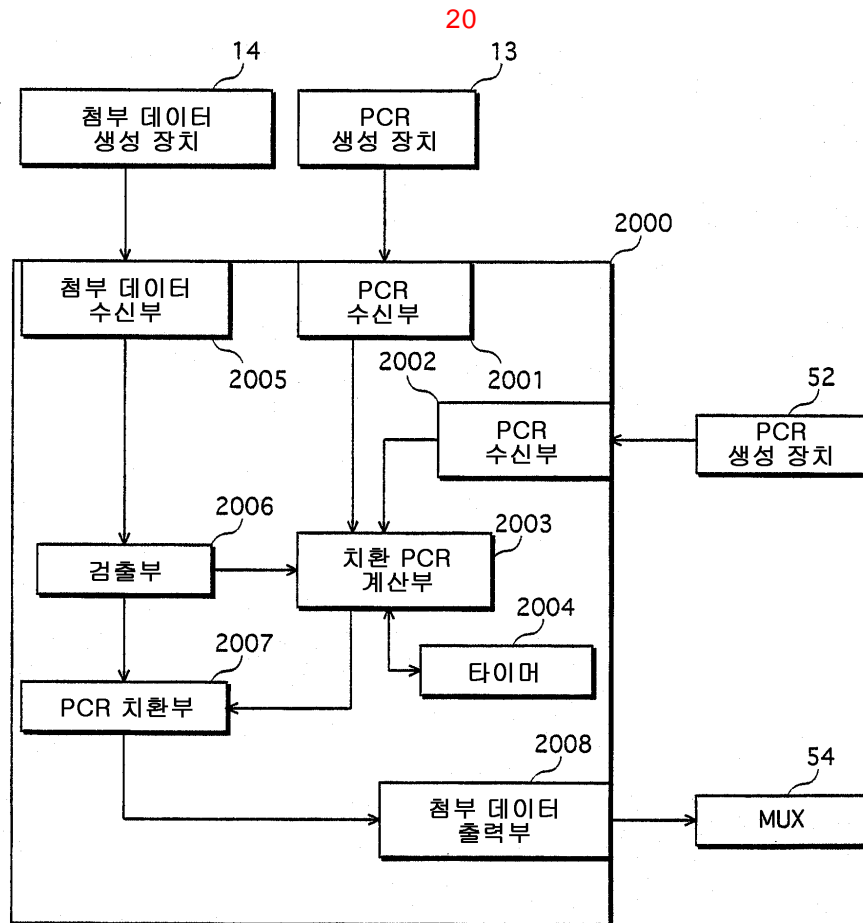


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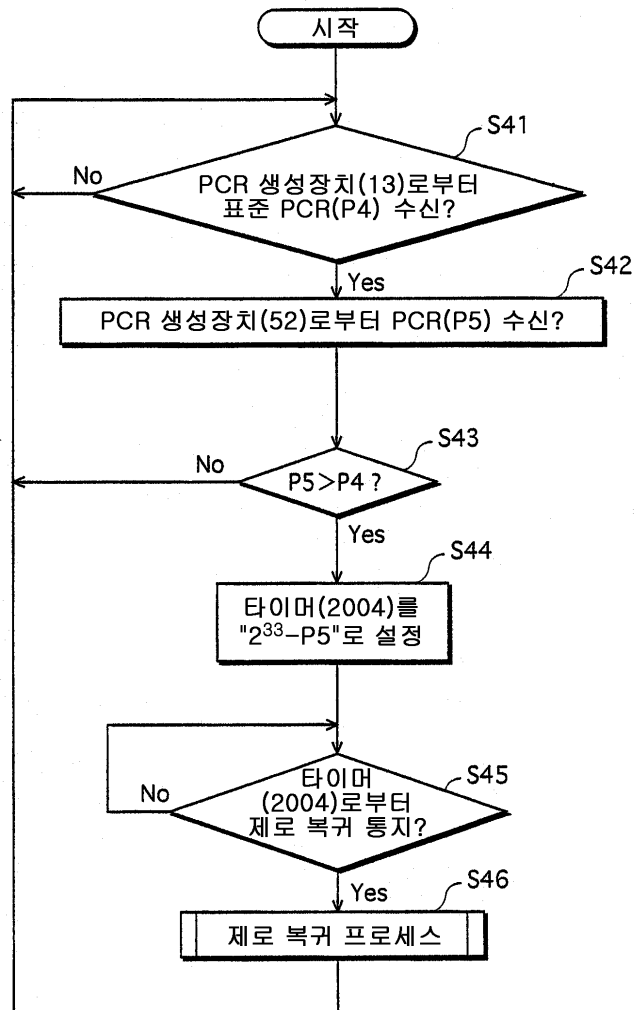


19

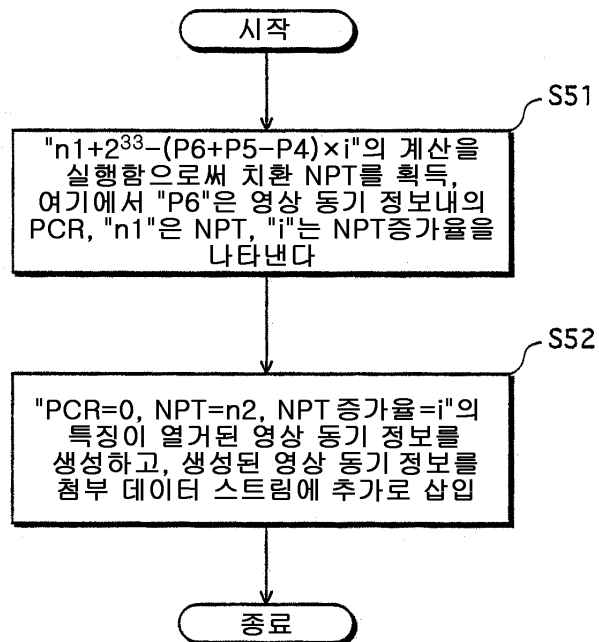




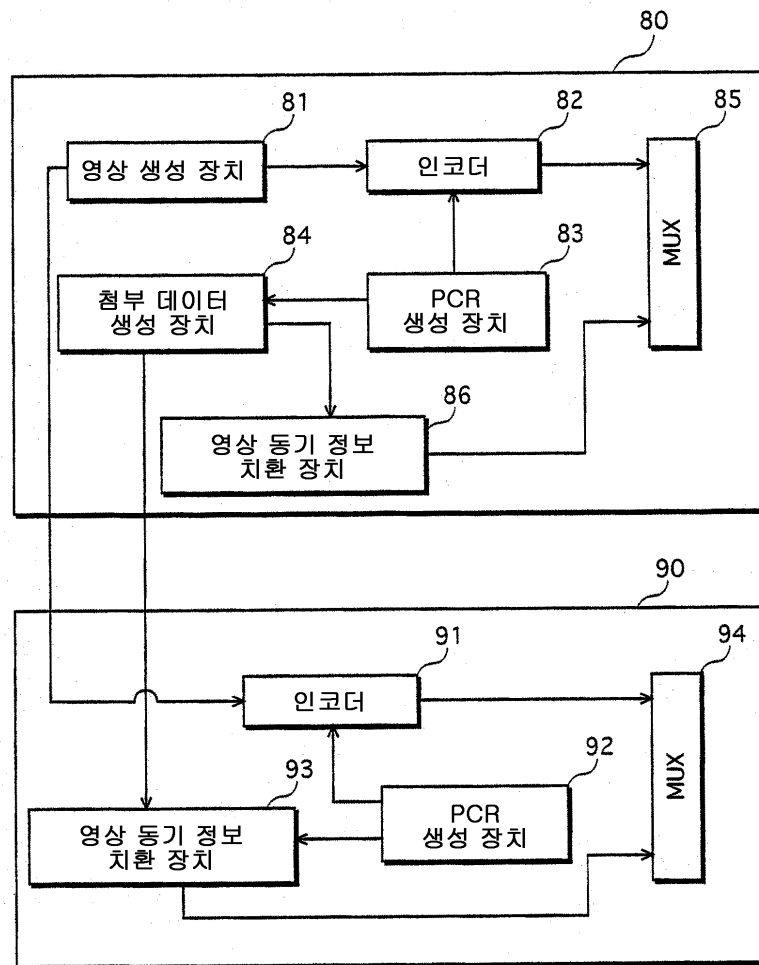
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22



23



6