

(19)
(12)

(KR)
(B1)

(51) 。 Int. Cl. 7
G09G 3/36

(45)
(11)
(24)

2001 10 24
10 - 0297605
2001 05 23

(21) 10 - 1996 - 0052751
(22) 1996 11 08

(65) 1997 - 0067075
(43) 1997 10 13

(30) 96 - 077937 1996 03 29
96 - 217492 1996 08 19

(JP)
(JP)

(73) 가 가

가 가 가 가 4 1 - 1

(72) 가 가 가 가 가 4 1 - 1 가 가

가
가 가 가 가 가 4 1 - 1 가 가

가 가 가 가 가 4 1 - 1 가 가

가
가 가 가 가 가 4 1 - 1 가 가

가 가 가 가 가 4 1 - 1 가 가

가
가 가 가 가 가 4 1 - 1 가 가

가
가 가 가 가 가 4 1 - 1 가 가

가 가 가 가 가 4 1 - 1 가 가

(74)

:

(54)

1 . 2 가 . 2 . 1 2 1
 N(N) , 1 , 1
 2

5

[]

[]

- 1 FIFO 가 .
- 2 1 .
- 3 CS - ON - GATE .
- 4 3 .
- 5 1 .
- 6 (1) 5 .
- 7 4/3 5 .
- 8 5 .
- 9 5 .
- 10 9 .
- 11 5 .
- 12 가 11 .

13	가	2	1
14	가 11		1
15	가		
16	2		
17	가	2	
18	5		
19	18		
20	3		
21	3		
22	4		
23	22		
24(a)	24(b)		
25	가	가	2
	4		
26	가		4
27	5		
28	27		
29	28		
30	28		
31			
32	31		
33	32		
34	6		

35	34			
36		7		
37	36			
38			3/2	37
39			5/4	37
40		8		
41	40			
42	40			
43(a)	, 43(b)	43(c)		9
44		9		
45	44			
46				
47	45	1	2 PLL	
48	45			
49(a)	, 49(b)	49(c)		9
50		10		
51(a)	, 51(b)	51(c)		10
52	50			
53		11		
54		11		
[]
[]
[]

CS - ON - GATE

TFT()

가

()가

VGA, SVGA, XGA
가

00 가
, XGA 1024 x 768

VGA 640 x 480 , SVGA 800 x 6

VGA SVGA XGA 가

가

1 4

1 (3), (2), (4) 1 (1A) (9) (1A),

(3) 1 (, " ")

1

(2) 1 ()

(4) (4a)

(4a)

(4A)

(4)

. 1

(3)

(4A)

2

(4A) FIFO()

가

2 FIFO (4A)가

(4)

. 2

3

FIFO (4A)

. FIFO (4A)

, 3

1

FIFO (4A)

, 1

(3) 가

1 (1A) (aperture ratio) CS - ON - GATE
 (1B)

3 CS - ON - GATE (1B) 4
 3 CS - ON - GATE (5A)
 ()
 TFT TFT (6)가
 (5A) 1 (3) (5)
 B - 1, 5B - 2 (2) (CLC) TFT(6)
 (VC)

(CS) TFT(6) TFT(6) 4
 (CS) TFT(6) TFT(6)
 (CS) TFT(6) (5B - 2)

(5A) (3) (1))
 (2) (5A) TFT(6)
 (CLC) 가 , (5B - 1) 가 () (ori
 entation)

1
 (4A) FIFO (4A) 가 .

3 (5) B - 1, 5B - 2 (CS) AC . AC
 (5A) 가 가 . 2
 CS - ON - GATE (1B) 가 . 2
 가

PLL(Phase Locked Loop)
 가 가 가
 가 가 가
 가

[]

가

[]

; 1
 2 ; 2 가 1 ; 2
 1 N(N) . 1 1
 2
 , 가 2 , 2 가 2 1
 1 가 2 1 ; 가 2 , 2
 , 가 2 1 , 2
 , 가 1 2 1 가
 , 가 2 , 2
 , N ,
 , 가
 , 1 가 M (M) 1 ,
 , N M ,
 , 가 1 ,
 ,
 1 ; (c) (b) ; (b) , (a)
 , 1 가 2 N (N) , 1

1, (d) (b) 1, 2, 2, ; (e) (b)
2, 1 2, 2, 가 1

, (b) , 2 2 2

, (b) , 2

(M) (a) , M

1 2 1 ; 2 가 1 , 2 ; 1
1 1 N(N) 2 1 2

1 , 가 2 , 2 2

, 2 1 2 ; 1
, 2 ; 1 2
1 1 ; 2 1 1 2 2 , 2

, 1 가 M (M)

, N M ,

,

1 ; (b) 2 , (a)
(N) (N) ; (c) (b) , 1 (a) 1
2 1 2
가 .

[1]

2 1 ; ,

5 1 (10) 6 (12), (20),

(30), (40) (10)

(12) 가

(20) (SIO) 1 1 (210) (220) (210) RGB

(CLK) (SIO)가 (H) (CLK) (210) (220) (210) RGB

가 (210) , 가 (220) (

210) 1 (12) (12) (220)

(30)가 (STV) , 1 가 (φx)

(STV)가 (H) (φx) 6 (Xxx)

(12) 6 X₁ 가 (Xxx)

가 X₂ 2 (40) (/OEG) (12)

(40) 6 () , n ,

n 1 7 2

7 3 2 7

(STV) 6 2

(φx) 7 (STV)가 (40) (X₁, X₂, ...)

(/OEG)가 , 2 (X₁, X₂, ...) 가

(12) (φx)

(1) (2) (X₂)가 가 2
 (2) (3) (X₃)가 가 3 (2) (1)가 2
 가 2 가 .
 가 3 3 4 5 .
 4 4 가 3 2 7 (4)가 4 3 (3) 3
 가
 (φ_c) (φ_x) 7 (φ_c) (φ_x) t₁
 (/OEG)가 (/OEG) (/OEG)가
 (4) 5 4 7 (3) 3 4 5 , 4
 가 (4) (φ_x) 1 5 5 (4) (4)
 t₁ (φ_c) t₁ , 5 (4) t₁
 5 (4) (φ_x) 1 5 (4) t₁ (4)
 가
 5 (40) 7 STV, φ_x
 /OEG (30) (460)
 5 (30) 8 S
 TV가 (30)가 (φ_x) 1
 (Xxx) (φ_c) (/OEG) (t₁)
 (30) (Xxx) (t₁)

8 (30) 120 (301) 120 AND (302) AND (301)
 (300) (301) (STV)가 , (301)
 120 1 (φx)가 (301) (ST
 V) (φx) 2 (2) (ST
 V) (φx) (301) 1
 (/OEG) AND (/OEG)가 , AND (3
 02) 1 가 AND (302) (/OEG)가
 , AND (302) 1 가 AND (302)
 7 (Xxx)가 (12) 가

9 5 (20) (20) (20) (210)
 (220) (21) (211) (212) (220)
 (221) (221) (12)

10 9 (20) (211) CLK
 (SIO) (211) (212)
 R, G B , R, G B . 1 3 (212)가 (CLK)
 , (221)가 , (R, G, B)가 LE
 (Oxx)(0₁, 0₂, ...) (12)

11 5 (40) (40) (420), (4
 40) (460) (420) (H - SYNC) ,
 (421) (440) (V - SYNC)
 , (441)

12 11 (460) J - K (461) (440)가
 10 J - K (461) , (440)가 12
 (STV)가 (440)가 STV가
 J - K (461) ()
 (STV)가
 (STV)가

13 11 (460) 13 (φx)
 (/OEG) , 2
 (T1) (460) (462, 463, 464), AN
 D (451, 452, 453) OR (454) (462, 463, 464) (H - SYHC)가
 AND (451, 452, 453) 가 . OR (454) (463, 464)
 (STV)가 가 (464) OR (454) (T1) 3
 ()
 4/3). 4 2 (T1) 1
 4 (40) 가

14 (456, 457) (460) J - K (465, 266, 467), AND (455) 2 NAND
 (420) J - K (465 467) (420) ()
) . (420) 480 , 3 (465) 0 240
 (466) 60 120
 (467) 0 120 (465) ()
 465a) AND (455) 가 (466) (466a) NAND (456) 가 ()
 (467) (466a) NAND (457) 가 (T1) NAND (456, 457)
 가 . NAND (456) (456a) AND (455) 가 . AND (455)
 (ϕ_x) , NAND (457) (/OEG)

15 14 (ϕ_x) 0 6
 0 (465, 466) (ϕ_c) 가 . 15 (ϕ_c) 15 (c)
 (T1)가 3 , 4/3 (T1) (1.33) 가

(T1)가 2 , 3/2 (1.5)
 (T1)가 4 , 5/4 (1.25) (T1)가 5
 , 6/5 (1.2)

1 가 FIFO 가 가 가

) 2 4 , 5/4(1.25) 4 ()
 . 4 1 가

16 5/4 2 2
 4 (ϕ_x) 2 (STV) 가 t₁ (ϕ_c) 가 4
 (/OEG) (ϕ_c) (4) 4 5 (x₄, x₅)
 (x₉, x₁₀) (4) 5 (x₅) 가 (5) 5
 10 (9) 10 (x₁₀) (/OEG) (ϕ_c) (8) 9
 0) (8) 10 (x₁)

6 (x₆) t₁ 가 , 11 (x₁₁)
 (9)가 가 가

3 . 3 (12)

7 (1), (2) 5 (3) (x₅) (4) , 3 (4)
 (12) 5 (x₅) 4 (x₁ x₄)

20 3 (/OEG) (ϕ x)
 t₂ (/OEG)가 Tw Tw
 (ϕ x) 1) t₂ Tw 가
 (4) 5 (x₅) (ϕ x) , Tw
 , 가 .

20 (/OEG) 21 (40) (476)
 (40) (420)가 (421) J - K (476)
 (476) 0 120 , 120
 (/OEG) 0

4 . 4

22 4 (40) 22 11
 22 (460) / (c3), (c4)
 (c5)

23 (STV) , 22 (460)
 (460) (478), (479) J - K (480) (440)
 (c5) m , m+1 m+2
 (c5)가 10 (m=10) , (478) 10 , 11
 12 (m, m+1, m+2) . m (4
 80) J - K 가 .

m , m+1 m+2 / (c3) m+1 m+1
 m+2 (c3) 가 , (479) m+1
 (c3) 가 , (479) m+2 (480) 24(a)
 m m+1 (STV)
 (480) 24(b) m m+2
 (STV)

25 [(1/n)T] , (40) 25
 17 J - K 463, 464, 471 J - K 25
 , J - K (485) 가 (485) (c4)
 1 4/3(n=3) , (485)
 J - K (464) (483a) 3 (3)

(T3) 14 (460)
 가 AND (490) 26 AND (490) (490)
 (T3) / (c3)가 AND (490) NAND (456, 457)
 가 (c3)가 AND (490) (T3) (T3) ()
 c3)가 AND (490) (T3) 26
 14 가

5 27 5 CS
 - ON - GATE

27 (11) CS - ON - GATE (13), (50), 2
 (70A, 70B) (71) (71) (13) ,
 (70A, 70B) (13) (13) ()
 (70A) , () (70B)
 (70A) (70B)
 (71)

(71) (HS) 1 1 , 1
 (71a) (HS) (H - SYNC)

(70A) (50) (GCKL) (50)
) (GCKL) (70a) CS - ON - GATE (13) ()
 (GCKL) (CLK) (70A) (70a)가 가 가 (GSPL)
 (STV) (70A) (70a)가 가 가
 (GOEL)

(70B) (50) (GCKR) (50)
 (GCKR) (70b) CS - ON - GATE (13) ()
 (GCKR) (CLK) (70B) (70b)가 가 가 (GSPR)
 (STV) (70B) (70b)가 가 가
 (GOER)

R) (50) (GSPL, GSPR), (GCKL, GCKR) (GOEL, GOE
가 (50)

28 (51), (50) 28 (50)
(52), (53), 1 (54) 2 (55)

(52) (DCLK) (GCK1, GCK2) (HS) (HS)

(51) 29 (53) (DCLK) (HS) (Q0, Q1) 2
29 (OE1, OE2, OE3) (OEI, OE2, OE3) (HS) 1 1

1 (54) (Q0, Q1) (GCK1 GCK2) 1
Q1=0 1 (GCKL GCKR) (GCKI)가 (GCKL GCKR) Q0=0
(HS) 4 3 가 3/2

2 (55) (Q0, Q1) (GOEL, GOER) (OE1,
OE2, OE3) 2 Q0=0 Q1=0 GOEL, GOER
(OE1, OE3)가 Q0=1 Q1=1 GOEL, GOER 가
(GCKL GCKR) (OE2) (L)가 Q0=1 Q1=0
GOEL, GOER (OE3, OE1)가 Q0=1 Q1=1 GOEL, GO
ER (L) (OE2)가

29 (GOEL, GOER) (70A, 70B)

3/2 24 (11) 29 30

30 27 (70A, 70B) 3/2 2

3

29 20 (70A) (50) (GOEL)
(GOEL) (70a) 29 30
(D1) (GOEL, GOER) (#1) (#1)가
29 30

(HS) (70B)가 (GOEL)가 (OER)
(70b) 가 (

70B) (#2) 가 (HS) (GOER) (HS) (HS) (GOEL)
 , (D)가 (#3) (GOER) (HS) (D2) 2 (#
 2, #3) .

(D3)가 (70B) (#4) .
 (D4)가 (70A) (#5) ,
 (70B) (#6) .
 2 가 ,

31
 (60) 6 .

31 (60) (71) .

32 (60) 32 (60) (61), (62)
 3 (63) (62) (HS) (DCLK) (DCLK) (61)
 (DCLK) (HS) , 2 (DCLK) 가 . (61)

2 (63) (DCLK) 2 (Q0, Q1) , 2 (Q0, Q1)가
 0 1, 1 0 1 1 (MCLK) . 2 (Q0, Q1)가
 2 0 3 (63) (L) . 3

(71) .

(71) 3 (63) (MCLK) (L))가
 가 , 33 #1, #2, #3 (MCLK) 1 33 (#2, #3) 가
 (L) (#1) 가 , (DSP)((SIO)

(71)

(#2, #3) (#1) 1 (D1) ,
 , (#2, #3) 3 (D) (#1)
 , 3/2 가 가 3 2

3/2 3/2 , CS - ON - GATE VGA(640 x480)
 3/2 (13) 가 .

6	6	1.25	6	6	5	2
7			6	5		
	(50)	28		34		
. 34		28	1	(54)	4	(56) 28
2	(55)	5	(57)		(Q0, Q1)	(51)
(Q2)						
	(50)	35		(GOEL, GOER)		
(GOEL, GOER)		4		1		
. 35			(D4)가 1	4	5	(4, 5)
,	(D8)가 1		(9, 10)			
34	가 , 4	(56)				

HS[Q2, Q1, Q0]

000 GCK1

001 L

010 GCK1

011 GCK2

100 L

101 GCK1

110 L

111 GCK1

5 (57)

HS[Q2, Q1, Q0] GOEL GOER 000

OE1 L

001 L OEI

010 OE1 L

011 OE3 OE2

100 L OE1

101 OE1 L

110 L OE1

111 OE2 OE3

	6		(GEEL)		(DI)
(70A)		(1)			(GOER)
(D2)		(70B)	(2)		
(GOEL)		(D3)	(70A) 3	(3)	
(4)		(GOER)	(D4)	(70B) 4	
(70A)	5	(5)	(GOEL)		(D4)
가			(D4)	2	(4, 5)
	4	(4)		가	
가		4			5/4
CS - ON - GATE		(13)	가		
	5	6	7		7
가				3/2	5/4
36	7		36	27	
		36	(50)		
		3/2	5/4	가	
37	36		(50)	(50)	34
(51),	(52),	(53), 4	(56)	5	(57)
(50)	28		(51)	28	
34	(51)	28	(51)	28	(52)
37	52A	, 28	(53)	37	53A
28	(GCK1, GCK2)	37	(GCK3, GCK4)	, 28	(OEI, O
E2, OE3)	37	(OE4, OE5, OE6)	(54)	GCK - B	,
(55)	(GOEL, GOER)	BI, B2	(57)	(GOEL, GOER)	A
I, A2					
	(50)	가 가	(59A, 59B, 59C)		가 3/2
	(59A)	(54)	(59B, 59C)	(55)	가 5/
4		(59A)	(56)	(59B, 59C)	(57)
	3/2		(59A)	(54)	(GCK - B)
(59B, 59C)	(55)		(B1, B2)		(GCK - B) (GCKL, GCK
R)	(70A, 70B)	가	(BI)	(GOEL)	(70A) 가
	(B2)	(GOER)	(70B) 가		
38	가	36		3/2	38
	29		, 38		

- 39 가 36 5/4 39
 35 , 39
 8 5 7 2
 (70A, 80B) 8 1
- 40 8 CS - ON - GATE (13) 1
 (70)가 (13) (71)가 (50A)
 (GSP) (GCLK) (70)
- 41 / (A/D) (81), OR(EXOR) (82), / (D/A) (83), A
 ND (84), OR (85), PLL 1/2 (86) (87) (5
 0A)
- 42 41 (50A) 1/2 (86) ((HS)
 가 (HS') (HS') EXOR (82) AND (84)
 (87) (DCLK) (GCLK1, GCLK2)
 (GCLK1, GCLK2) AND (84) (HS') (GCLK2) AND
 (GCLK1)가 가 OR (85)
 EXOR (82) (HS') OR
 OR D/A (83)
 40 (71) 가
- 42 (GCLK) (DI) 1 1 (D2) 2 2
 (GCLK) (D3) 1 (D4) 2 3
 (DI) 1 가 (D3) 4 (D2) 3
 5 6 3/2 2 가
- 31 , 32 33
- 43(a) 1024 × 768 XGA (1, 2, ...)
 43(a) () ()
- 43(b) SVGA (800 × 600) 가 5/4 (=1.25) 1024 × 7
 68 , 1024 × 768 4
 (4) 1 (1)가 2 ()
 (1, 2, 3, 4) 1 (1) 2
- 43(c) VGA (640 × 480) 가 3/2 (=1.5) 1024 × 768
 , 1024 × 768 2
 (2) 1 (1)가 2 (1,

2) 1 (1)가 2 , (3, 4) 1 (3)가
 2 .

43(b) 43(c) (CLK1)
 (CLK2) 2 .

44 9 44 (6
 10), (612), () (614), (616) (

) (618) .

(612) , (616) (/HS)
 (/VS) , (612) (616) (616) (612)

(614) (612) 1 (618)
 (616) (610) (618) (

618) (610) 1024 x 768
 (610) CS - ON - GATE .

45 (612) (616) (612) A/D
 (621), 620₁ 620₂ 1 D/A (625) A/D (621)
 (DATA - IN)가 n (n) n 1 (620₁ 620_n)가
 (612) .

A/D (621) (DATA - IN) n , 1 (620₁ 620
 n) A/D (621) (616)

1 (620₁) (S/P) (622), (FF) (623) (MUX) (624)
 S/P (622) 4 1 (4 1) , 4 (6

23) S/P (622) (616) (624) 4 1 (6
 (616) 1 D/A (625) (624)
 1 D/A (625) n 1 (620₁ 620_n)
 (DATA - OUT) (614)

2 PLL (616) (626), 1 PLL (PLL1) (627),
 (PLL2) (628), (629), (630) (631)
 (616) n 1 (620₁ 620_n) .

(626) (/HS) (/VS) ,
 (626) 2 (MO, M1) 46 (MO, M1)

M0=1, M1=1 XGA

M0=0, M1=1 SVGA

M0=1, M1=0 VGA

M0=0, M1=0 VGA

(M0, M1) PLL (627, 628) (629)

1 PLL (627) (/HS) (DATA - IN) 1
(CLK1)

47 1 PLL (627) 2 PLL (628) 47 1
PLL (627) (632), (633), (634), (VCO)(635) (M0, M1)
M0, M1) () 가 N (636) VCO(635) (63)
2) (636) (/HS) (632) (634) VCO(635)
가 (633)

2 PLL (628) (/HS) (610) 2 (C
LK2) 2 (CLK2) 2 (CLK2)
(629) (630) 가

45 (629) 2 (CLK2) (M0, M1)
(EN) (630) (EN) 1
(EN) 1.25 1.5 1 (630)가
) (630) (630)가 (CLK2)가 2 ()

(630)가 2 (CLK2) , QA, QB 2
() (QA) (QB) 2 (624) 4
, 2 (QA, QB)가
(618) (631) (/HS) (/VS) (614)
(631)

48 (629) 48 (629) 2 (636), (63
7, 638) AND (639) 2 (636) 2 (CLK2) , Q0, Q1
(A1) 가 (638) (/HS) (Q0) (637)
(AI) +5V (M0) (63

7, 638) (A2) 가 , (M1) (637, 638) (A3) 가 . (63
 7, 638) (/Y) AND (639) 가 , (EN)

M0=M1=1 , XGA 가 , (637, 638) (636) 1
 . M0=0, M1=1 , SVGA 가 , (637, 638) (/Y) (636)
 가 4 0 (EN) 4 0 .

49(a) , 49(b) , 49(c) 9 . 49(a)
 1(XGA) 49(b) 1.25(SVGA)
 . 49(c) 1.5(VGA) .

(M0, M1) 2 가 1 49(a) (629) (EN)
 1 (OUT1) (630) (OUT2) , (624) (623)

M0=0, M1=1 49(b) , (629) (EN) 2
 (CLK2)가 4 (630)
 (624) 49(b) (OUT2)
 (1, 5, 9)가 2 SVGA (800 × 600) 5/4(=1.25)
 XGA (610) 가 .

49(c) M0=0(1), M1=0 (629) (EN)
 2 (CLK2)가 2 (0) (600)
 , (624) 49(c) (OUT
 2) (1, 3, 5, 7, 9, 11)가 2 . VGA (640 × 480) 3/2(=1.5)
 XGA (610) .

1 (620₁ 620_n) S/P (622), (623) (624)가 8
 (620₁ 620_n) 1.125(=9/8) 가 . 1
 , 가 .
 10 .

50 10 (612) (616)
 . 50 . 50 (6)
 12) A/D (621) 8 (641)
 . D/A (625) (641) 8
 (DATA - OUT) .

(616) (624) (642), 1 PLL (627),
 2 PLL (628) (631) . (642) 2 (CLK
 2) (M0, M1) , (ADD) .

10 A/D (641) 1 (C
 LKI) (641) (M0, M1)
 (CLK2) (641) 2 ((641)
 642) (ADD) (ADD) (641)
 1 (CLK1)

51(a) , 51(b) , 51(c) 51(d) 10 51(a)
 (641) 1 (CLKI)

51(b) 1 (642) (ADD)
 (641) 8

51(c) 1.25 (642) (A
 DD)가 , 가 2 (CLK2) 4 가 2 가
 51(c) (1, 5, 9)가 2 8 가
 2 (CLK2) 4 2

51(d) 1.5 (642) (AD
 D)가 , 가 2 (CLK2) 2 2 가
 51(d) (1, 3, 5, 7)가 2 8 가
 2 (CLK2) 2 2

가 (CLK2) (641)

52 50 (642) 52
 52 (637, 638) 48 (644) 가
 (EN) 48 (644)
 (EN) , 2 (CLK2) (/VS)
 2 (CLK2)가 4 1.25 (644)
 2 (CLK2)가 2 1.5 (644)

1.2 11 53
 11 (612) (616)

1.2 (612) 1 (620₁ 620_n) 5 S/P
 (622A), 5 (623A) 5 (624A) (616)
 (629) (630) (629A) (630A) (M0, M
 1) 1.2 (629A) 2 (CLK2) 5
 (EN) (630A) 1 (620₁ 6
 20_n) 5 가 , (630A) 3 (QA, QB, QC) 1.2 ,
 (M0, M1)가 0

54 53 54 (EN)
 2 (CLK2) 5 , (630A)
 (1, 6, 11) 2
 9 11 () 1 (CLK1)
 (610) 2 (CLK2) , 가
 (EN) 2 가 .
 1 8 9 11
 가 .

(57)

1.

; 2 ; 1
 ; 2 가 1 ; 2 2
 N(N) , 1 1 1
 2 , 2 1 , 가
 2 1 ; 2 , 2 가
 2 1 , 1 2

2.

1 , 가 2 2 , 1 2
 2 2

3.

1 , 1 2 1 가
 .

4.

1 , 가 2 , 2

5.

1 , N , .

6.

1 , .

7.

1 , 1 가 M (M) 1 , .

8.

7 , N M , .

9.

7 , 가 1 , .

10.

1 , .

11.

2 ; (e) (b) 2 , 1 2 ; (c) (b) N (N) 2 , 1 ; (d) (b) 1 , 1 ; (a) 2 , 1 , 가 1 .

12.

11 , (b) , 2 2 , 2 .

13.

2 1 , 2 2 2 1 , (c) 2

21.

20 (b) 1 2 (b
-1) ; (c) 2 1 2 (b-1) , 2 1
1 , 2 1 2 .

22.

20 (a) ,
M (M)

23.

;
, 1 ; 1 2 2 1 ,
1 ; 1 2 2

24.

23 , 1 A/D ,
 ; A/D 1 ,
, 2 .

25.

24 , 2 1 1 ,
2 2 , 2

26.

25 , 2 .

27.

24 , 2 가 가
, 2 가 .

28.

23 , 1 ; A/D 1 A/D , ; 1 ; 2

29.

28 , 2 2 1 1 2 ,

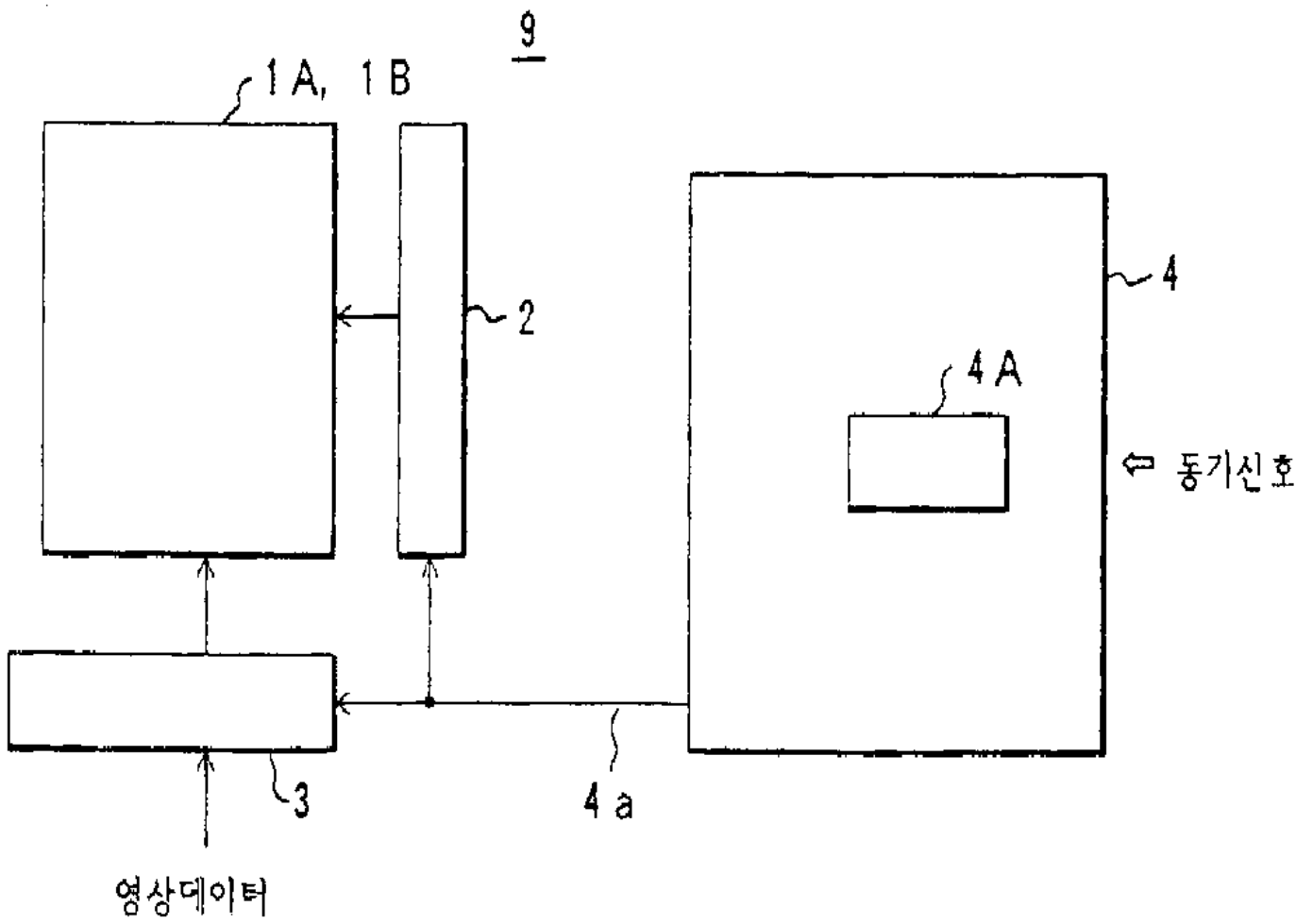
30.

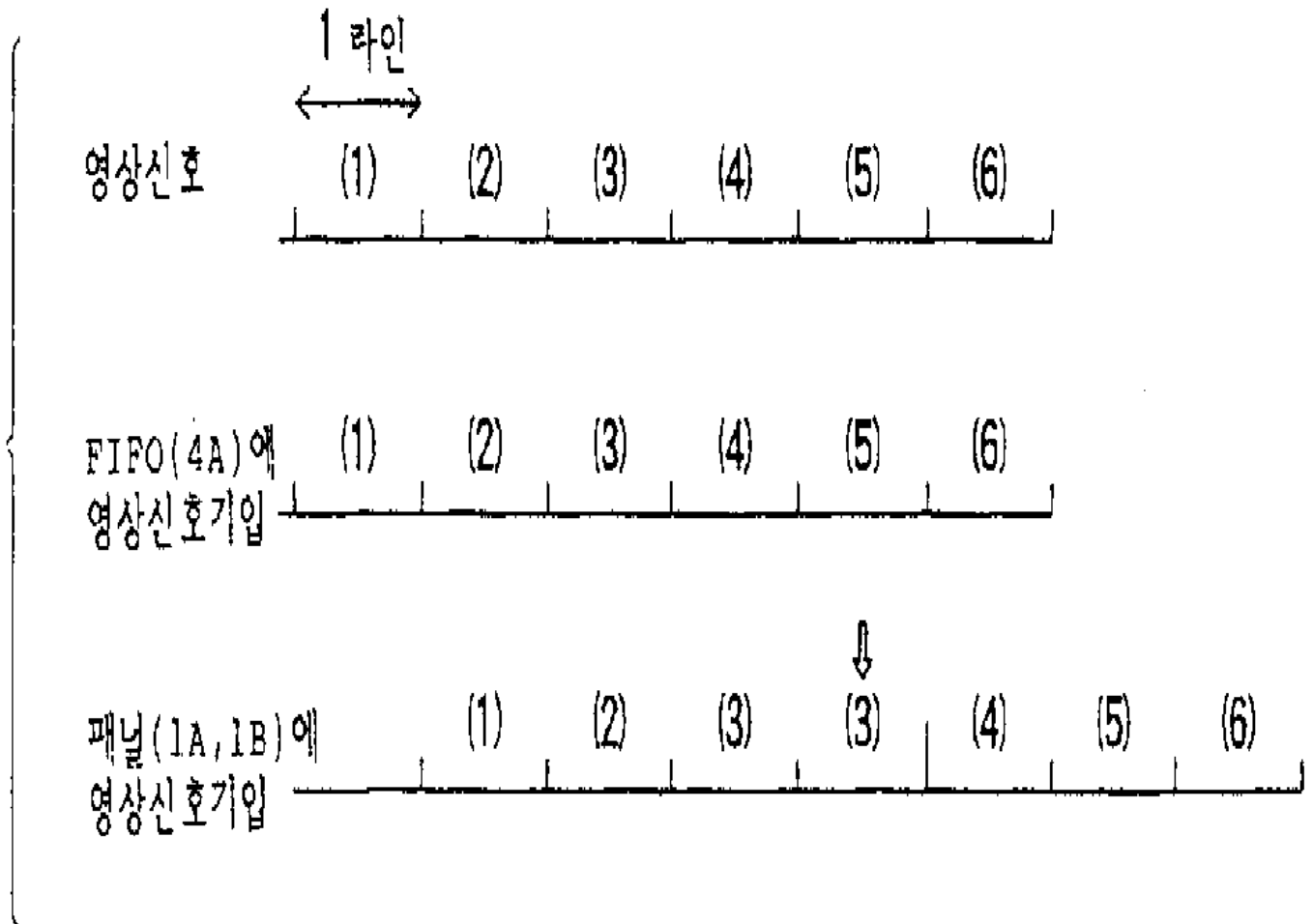
29 , 가 .

31.

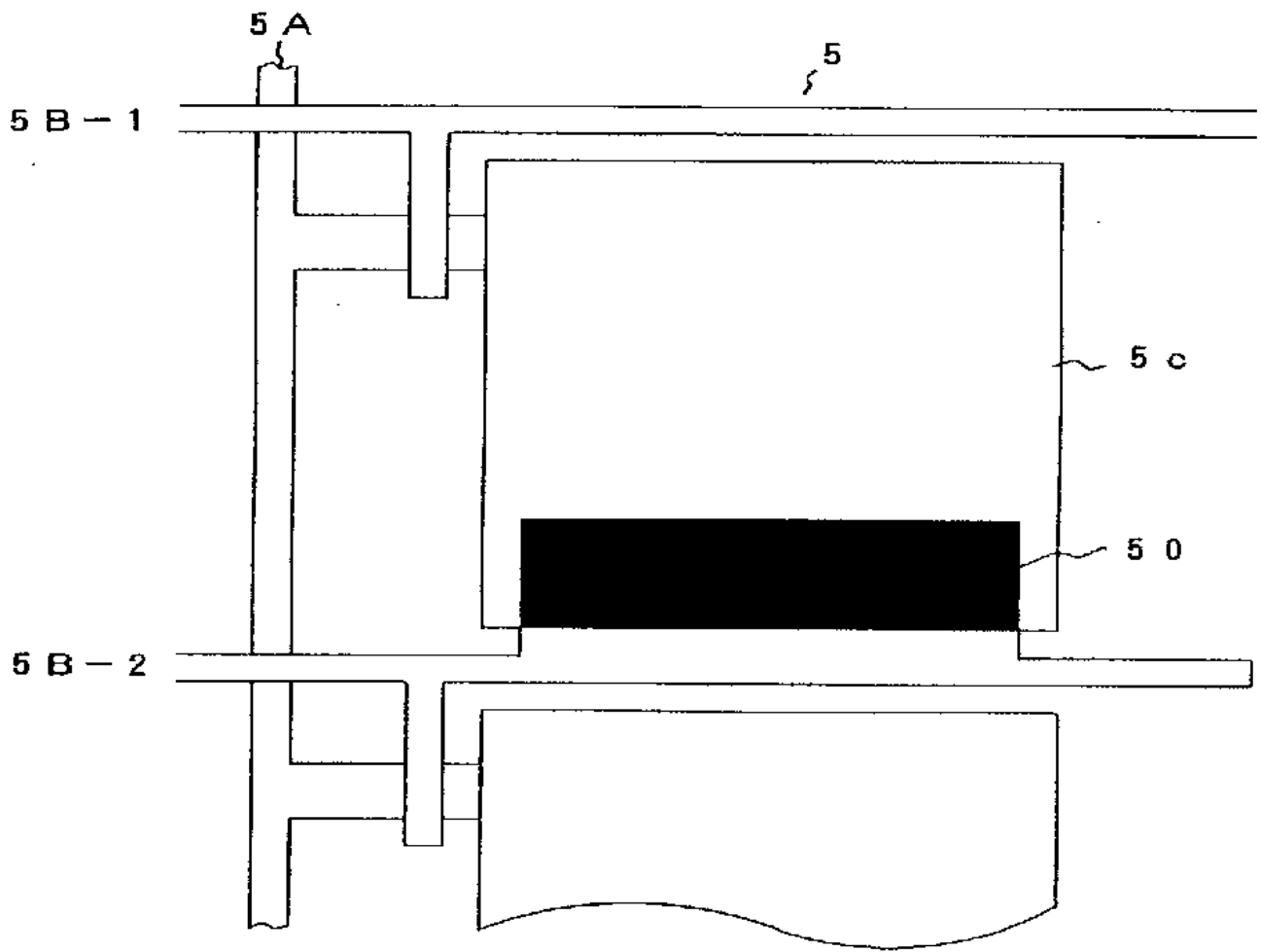
29 , 2 , 2 가 가 .

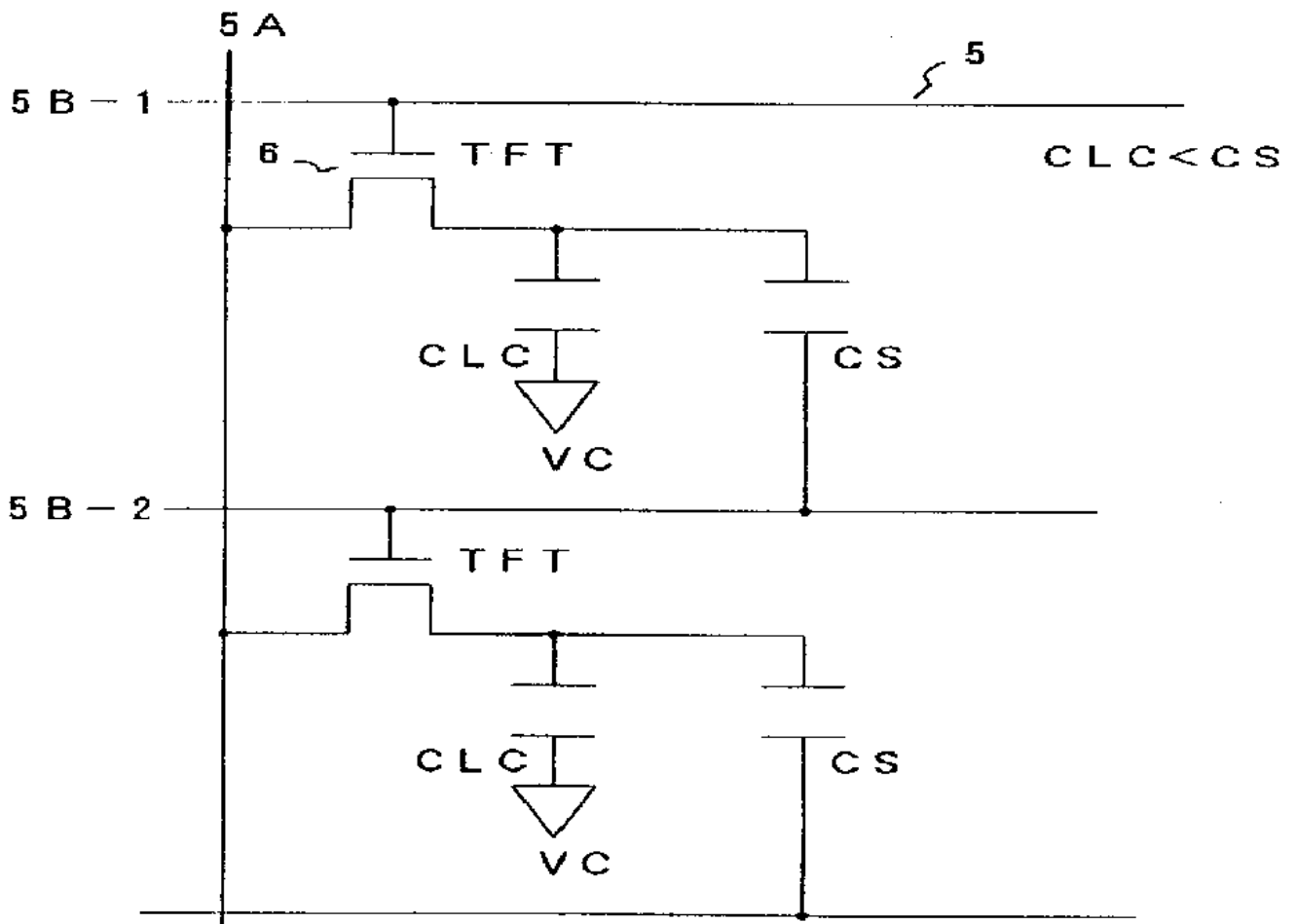
1



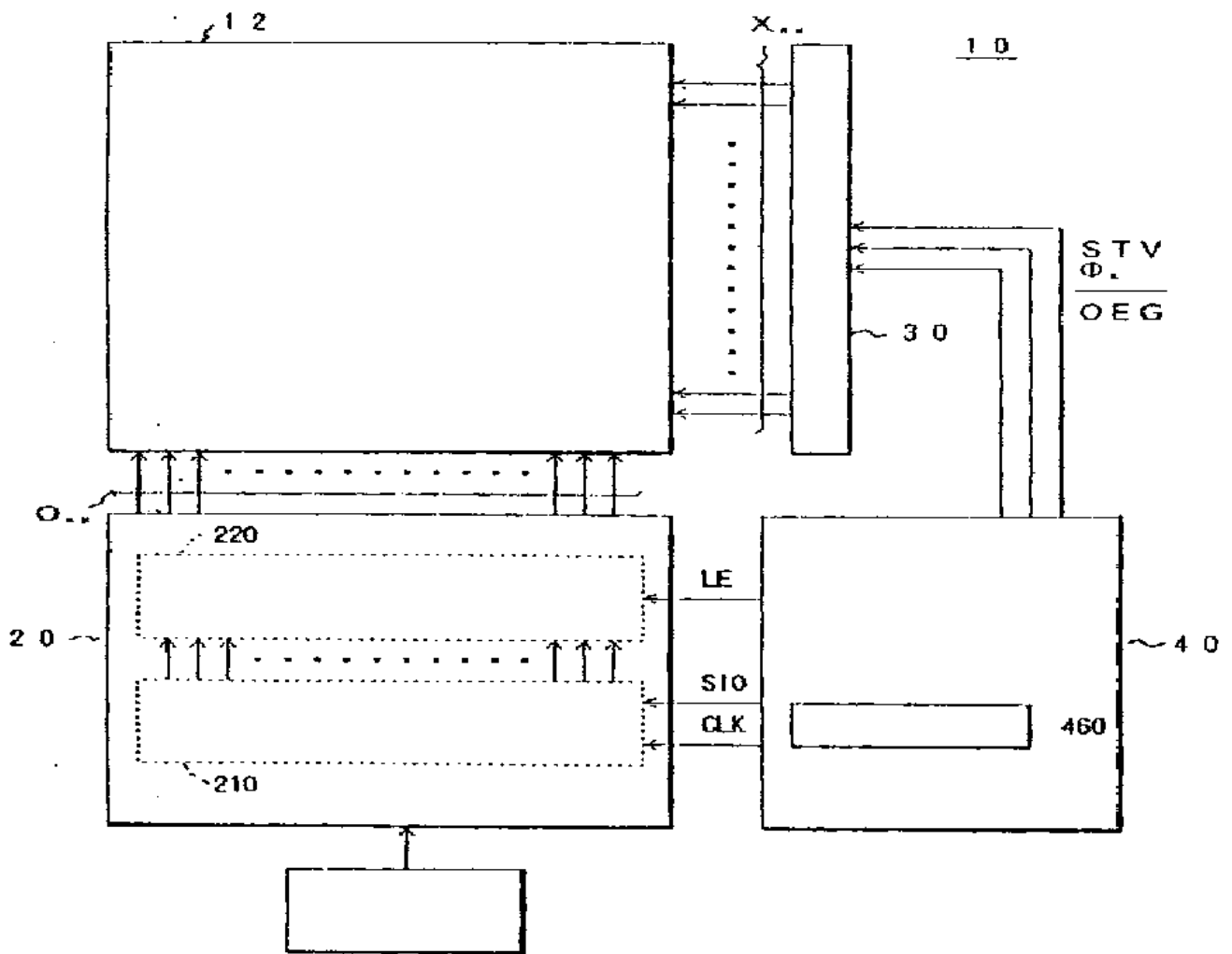


3

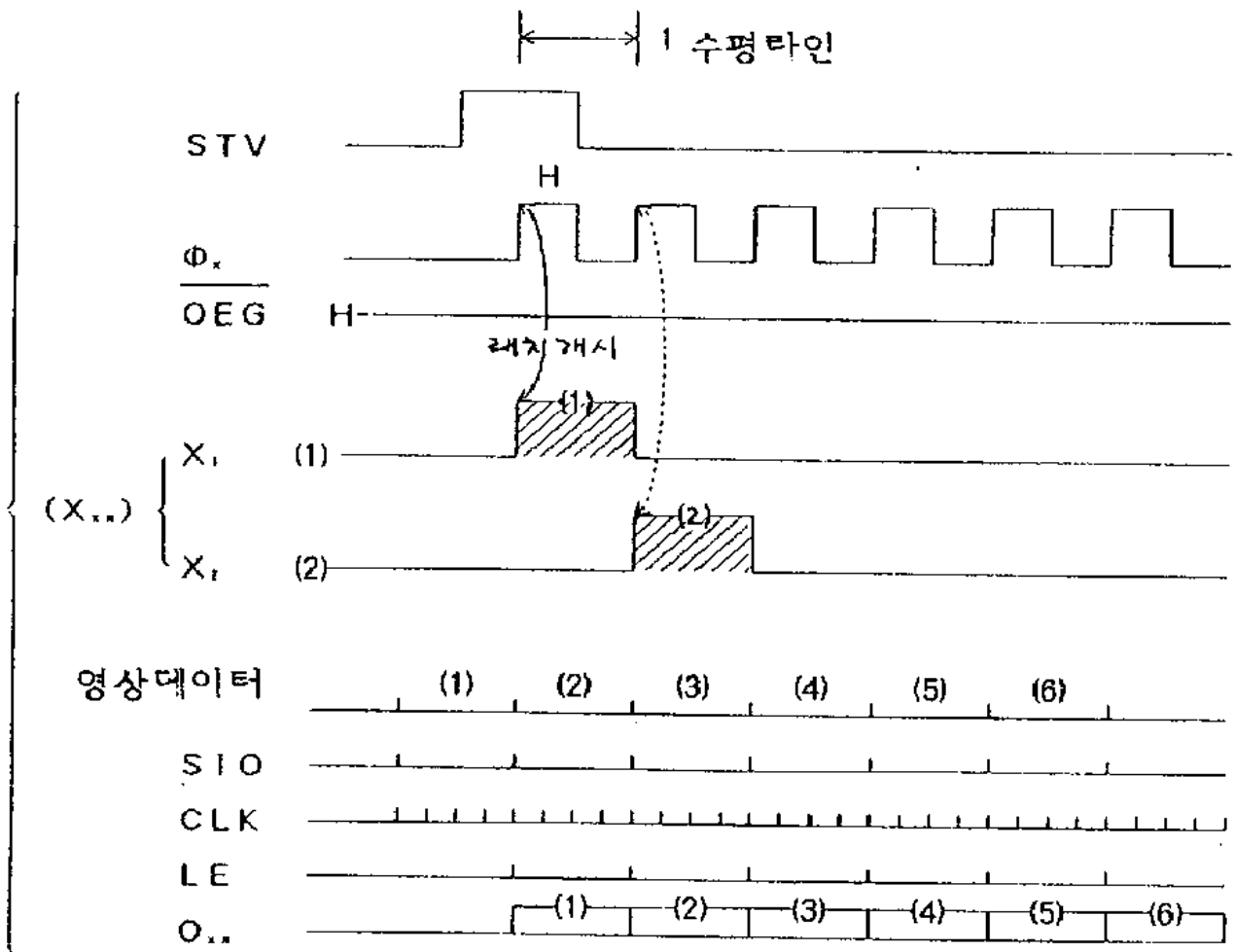


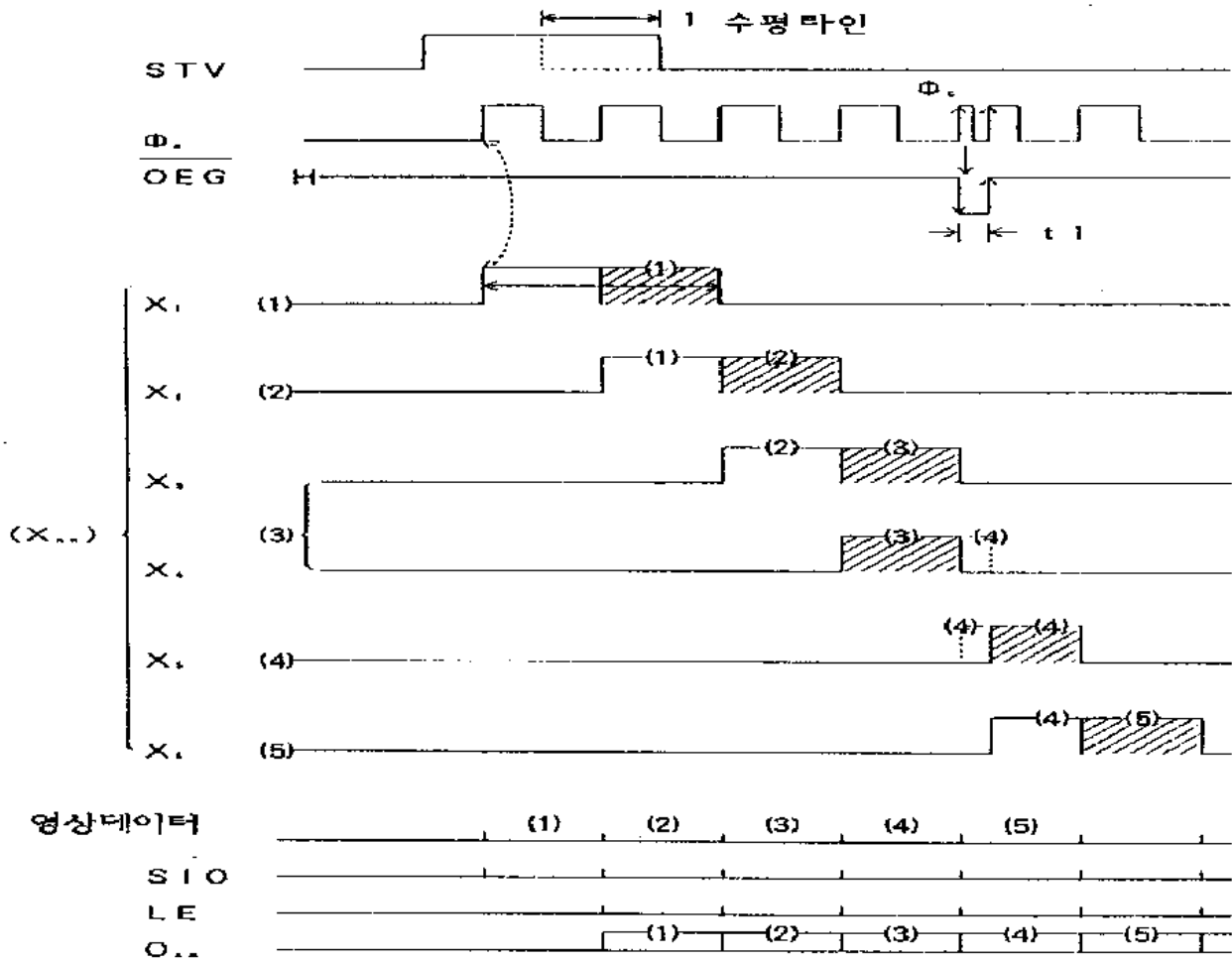


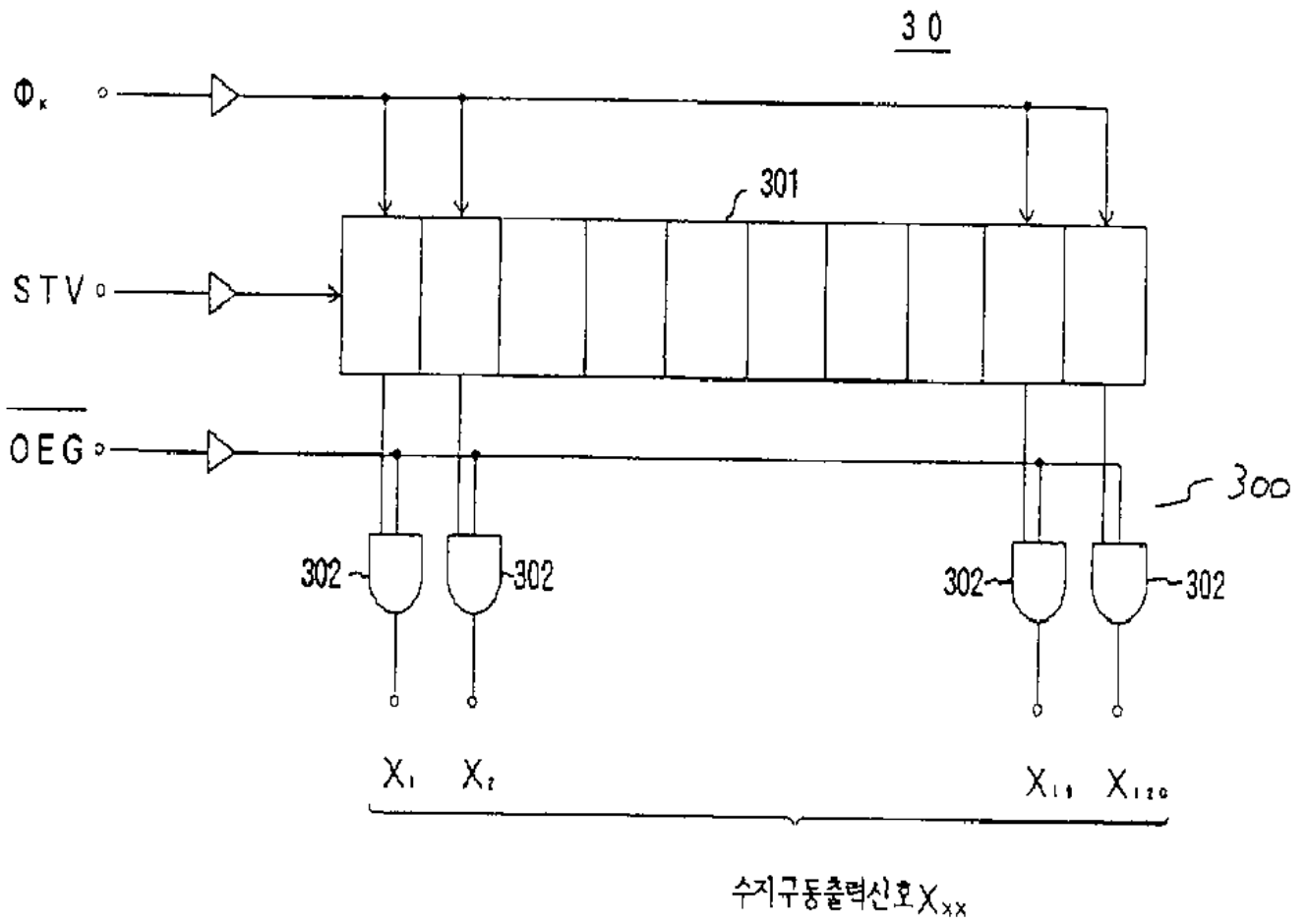
5



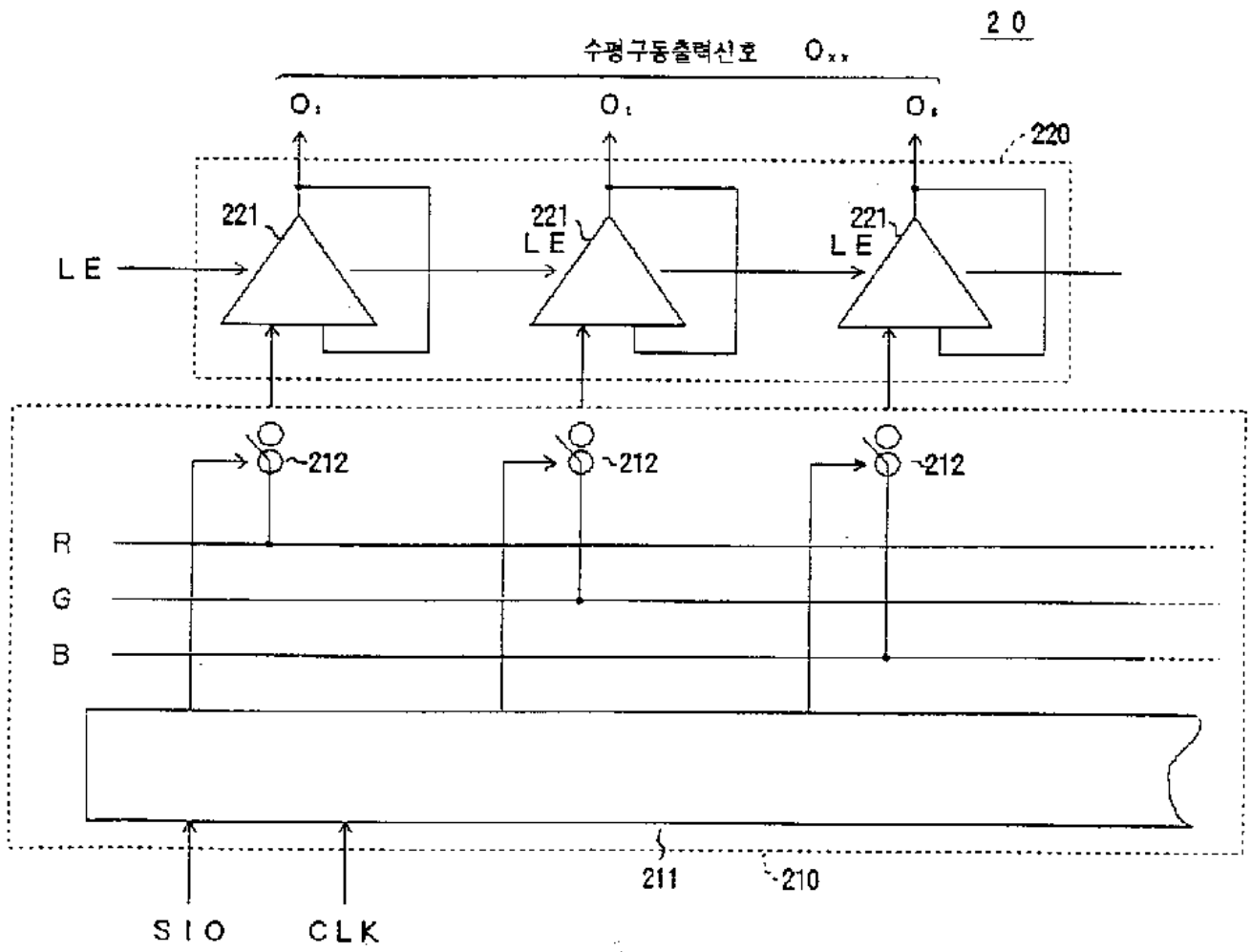
6

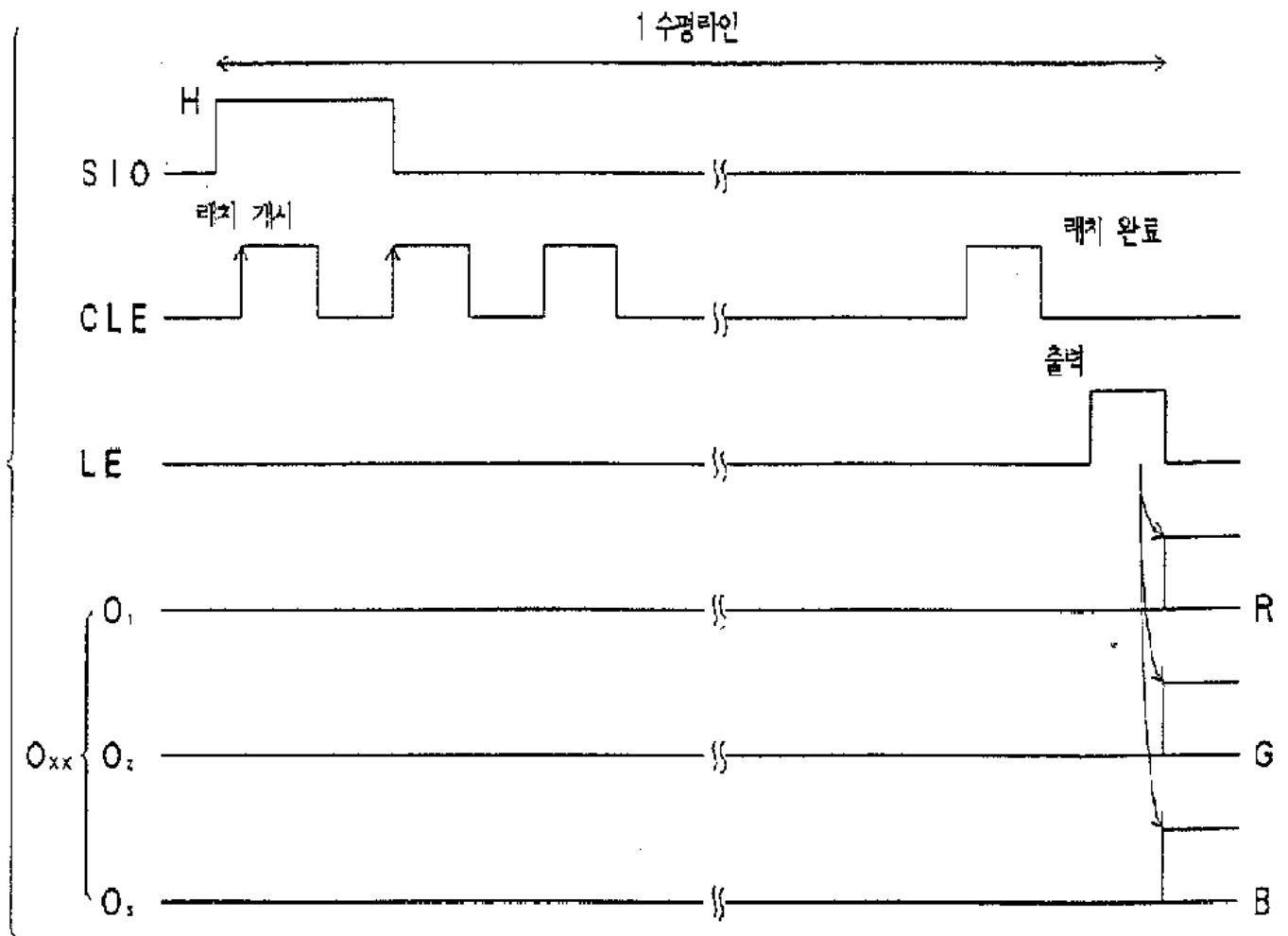


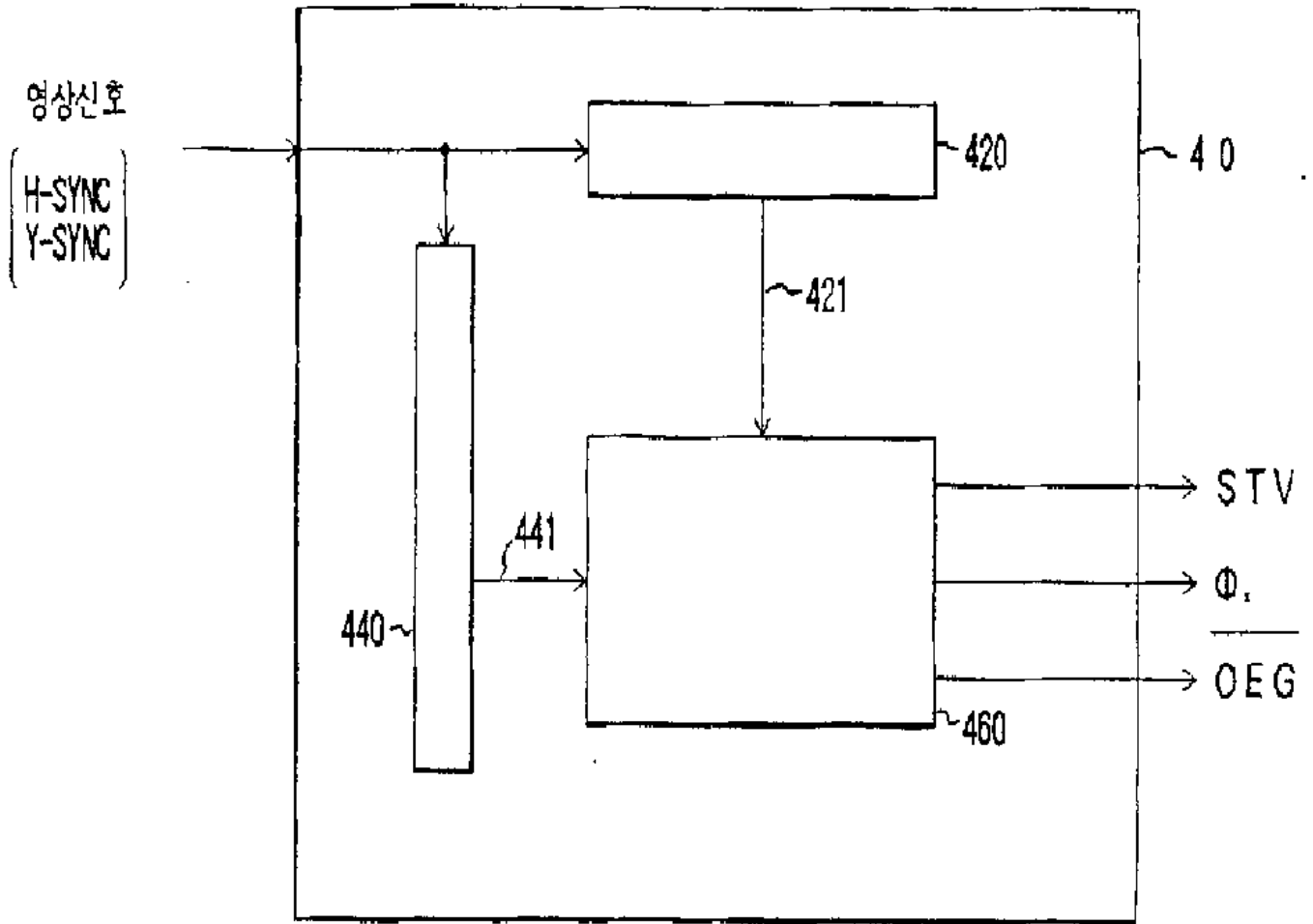


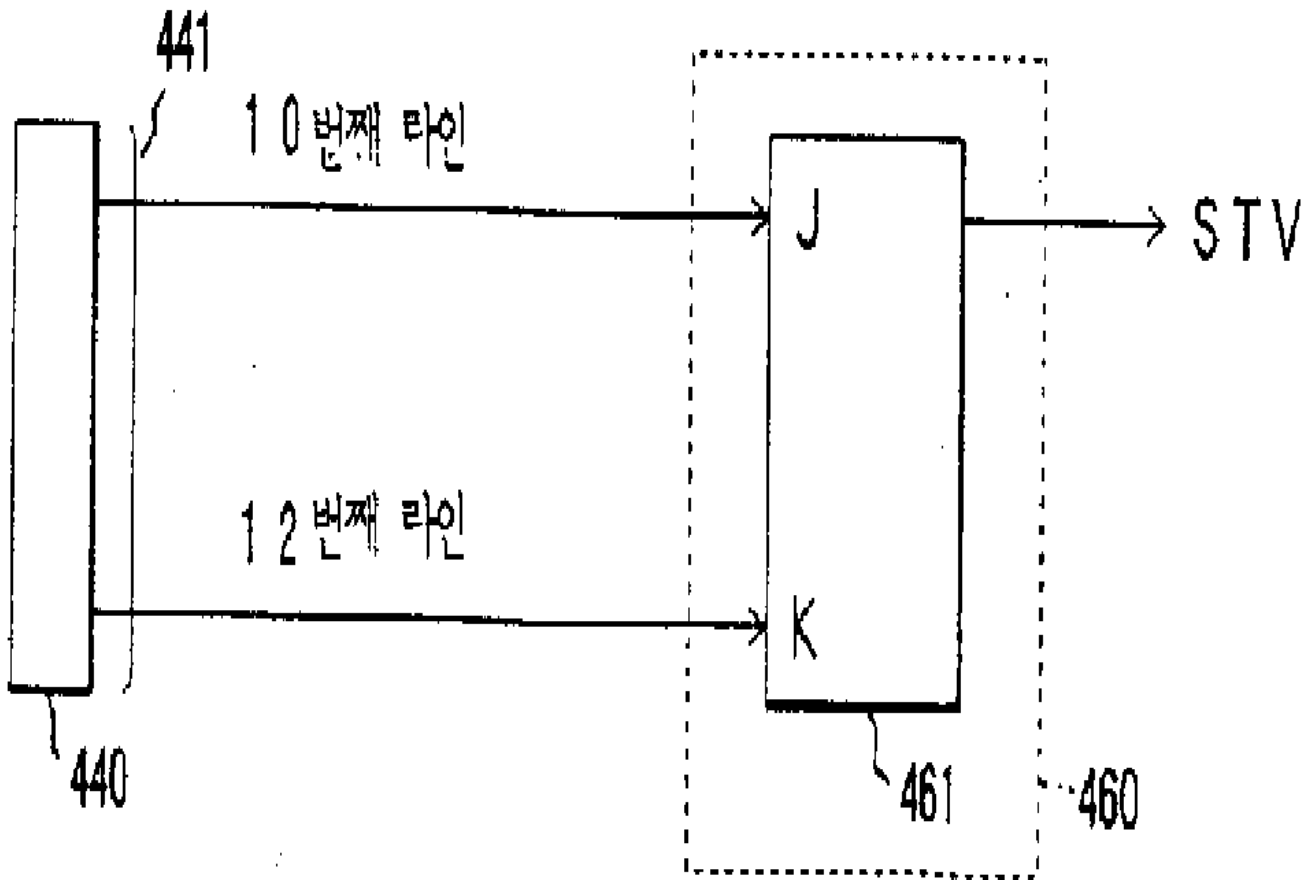


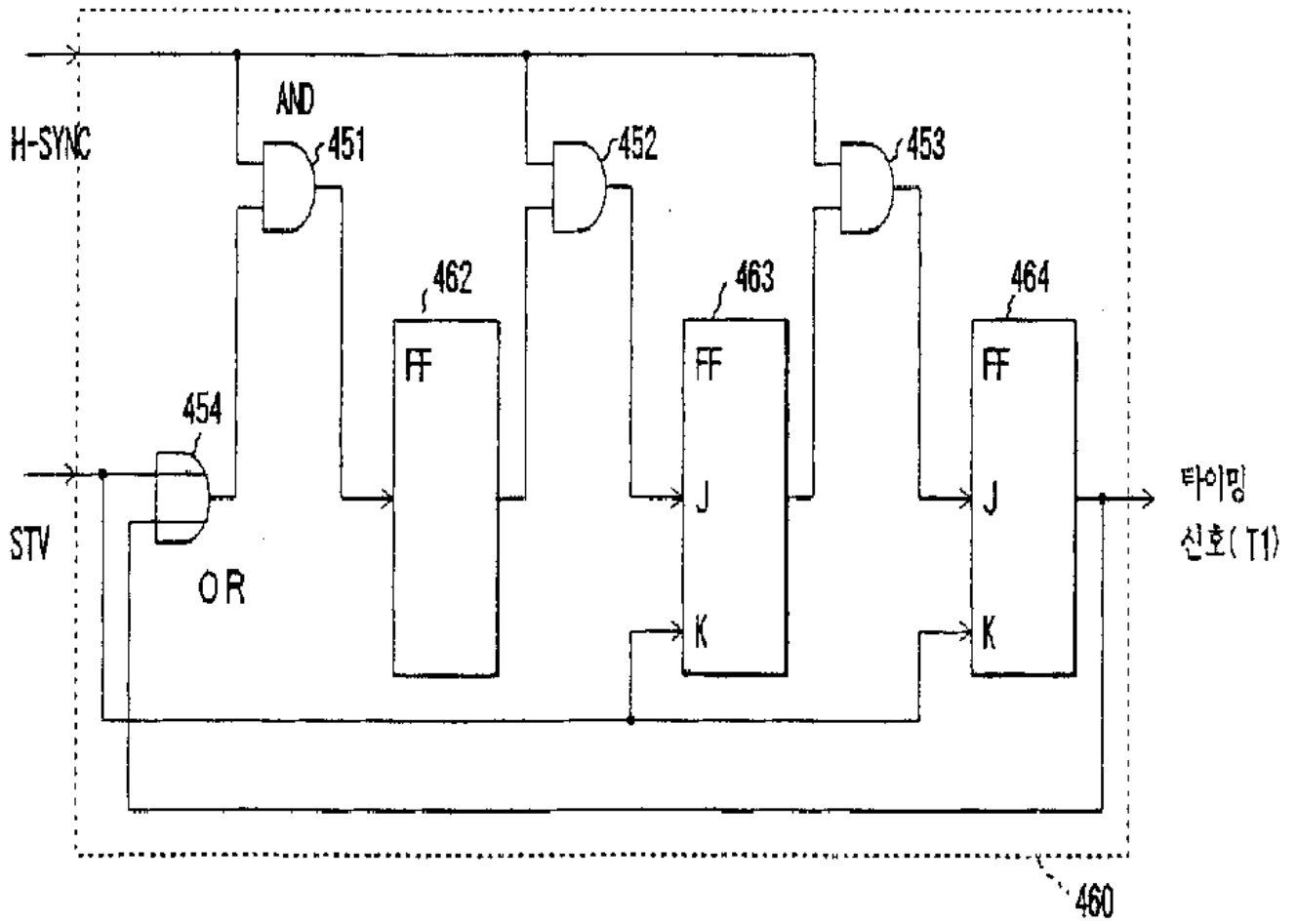
수지구동출력신호 X_{xx}

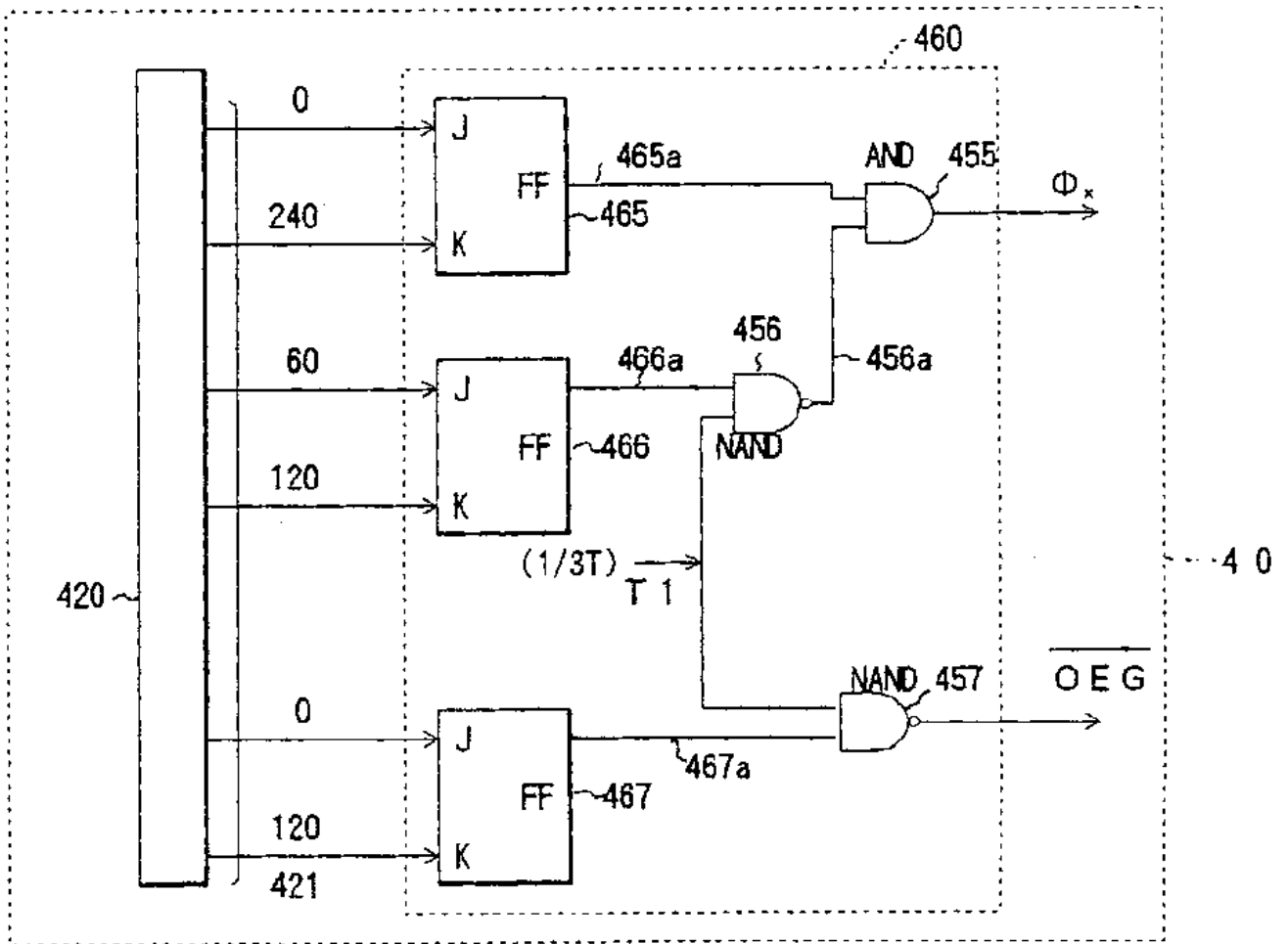


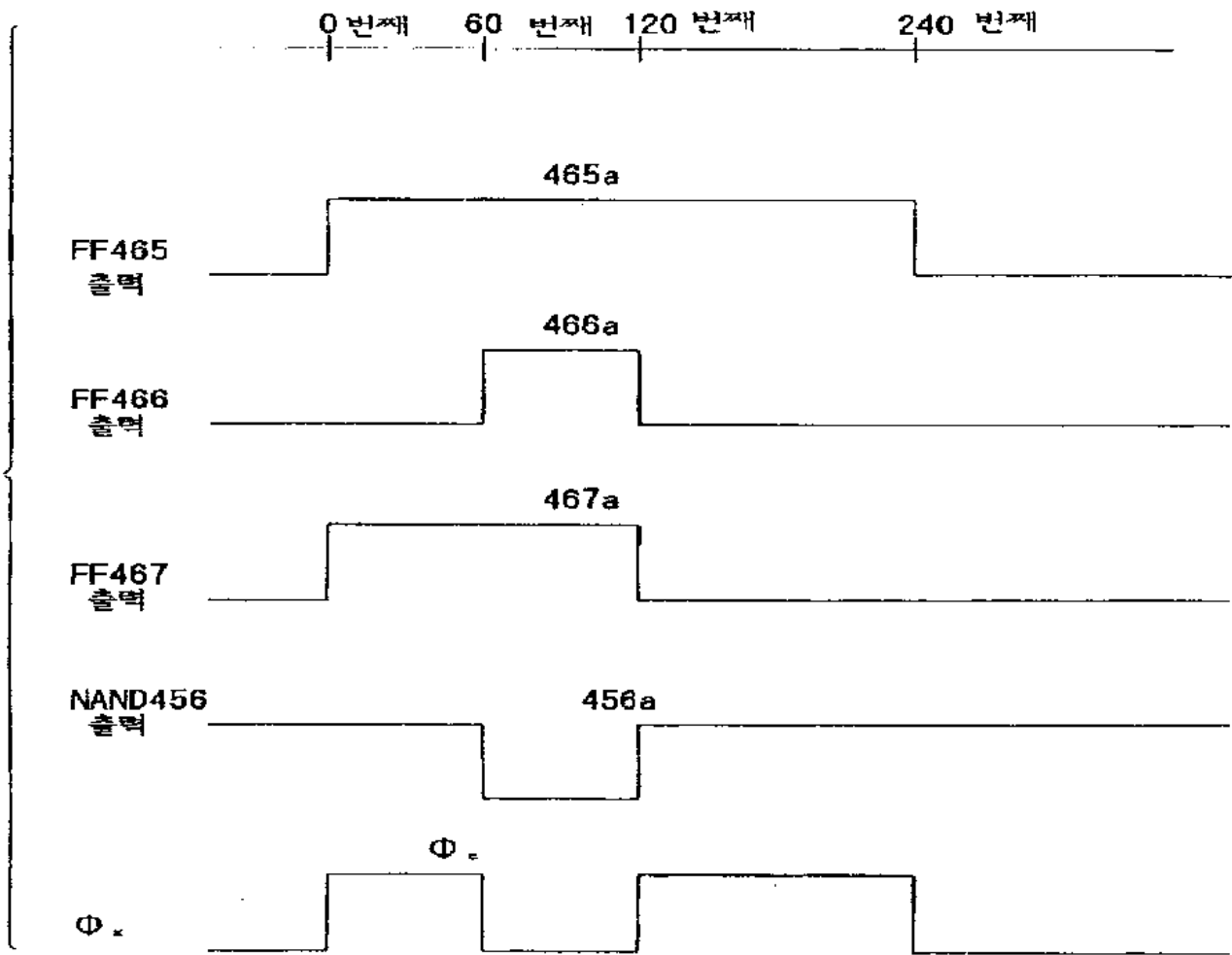


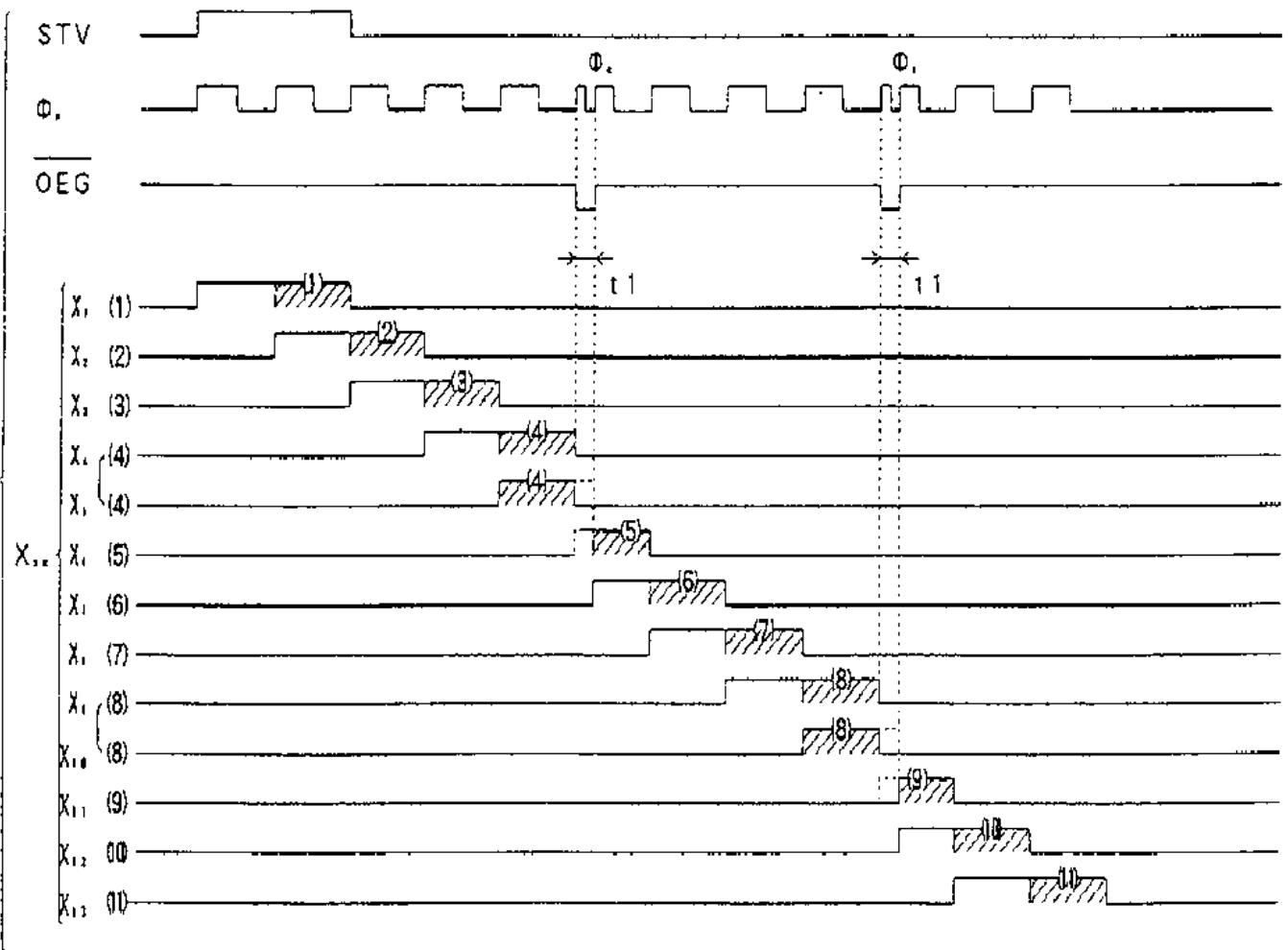


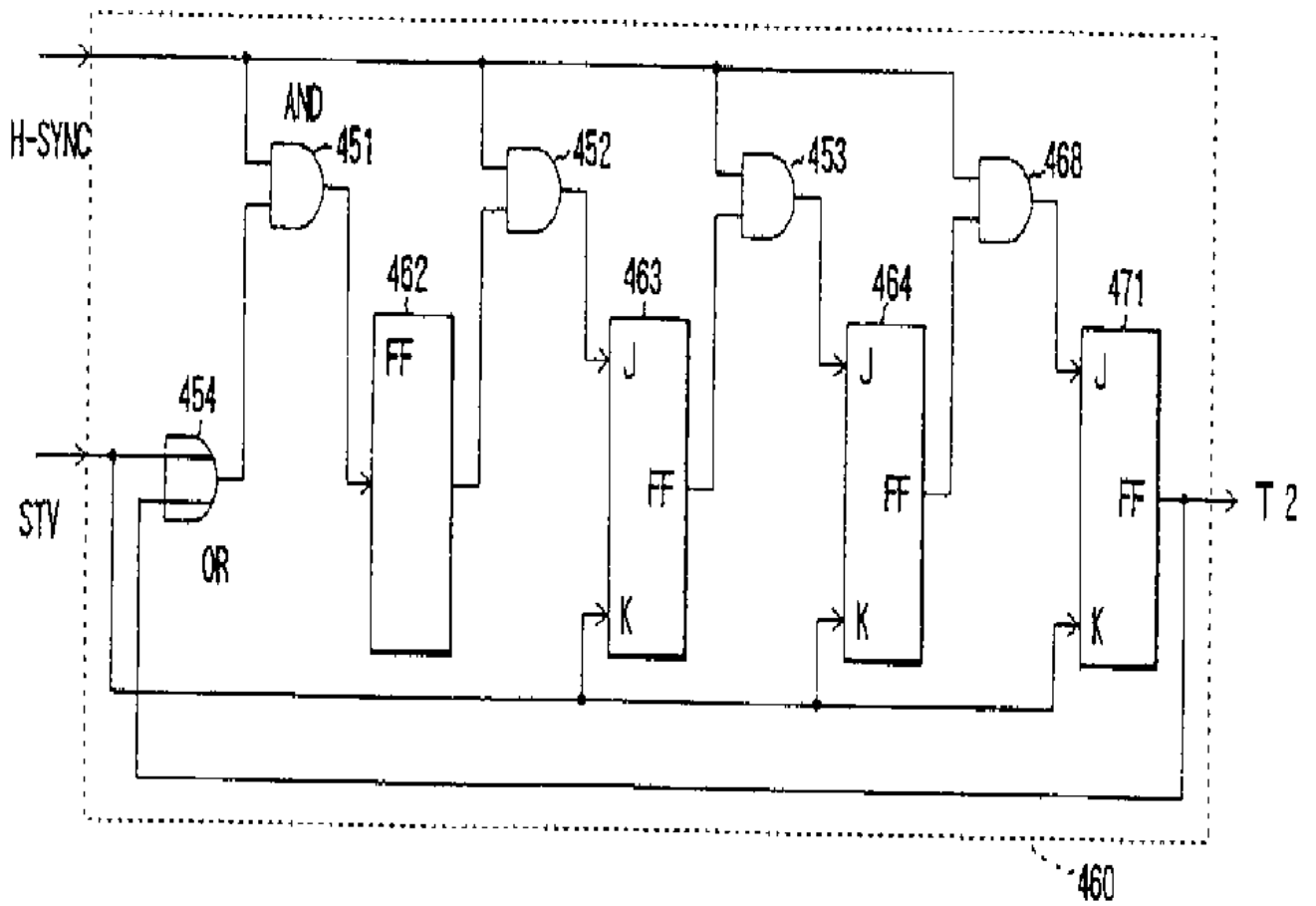


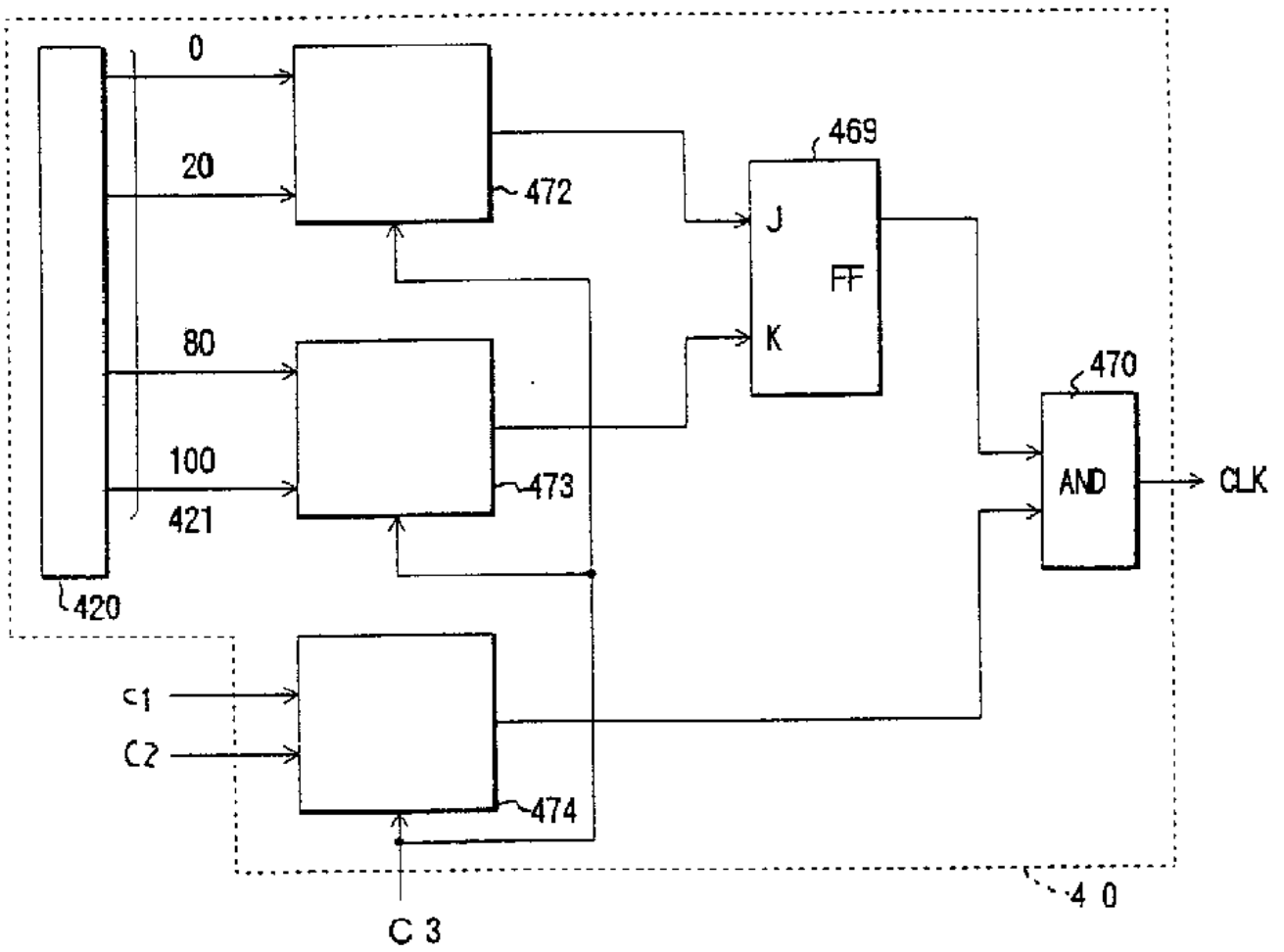


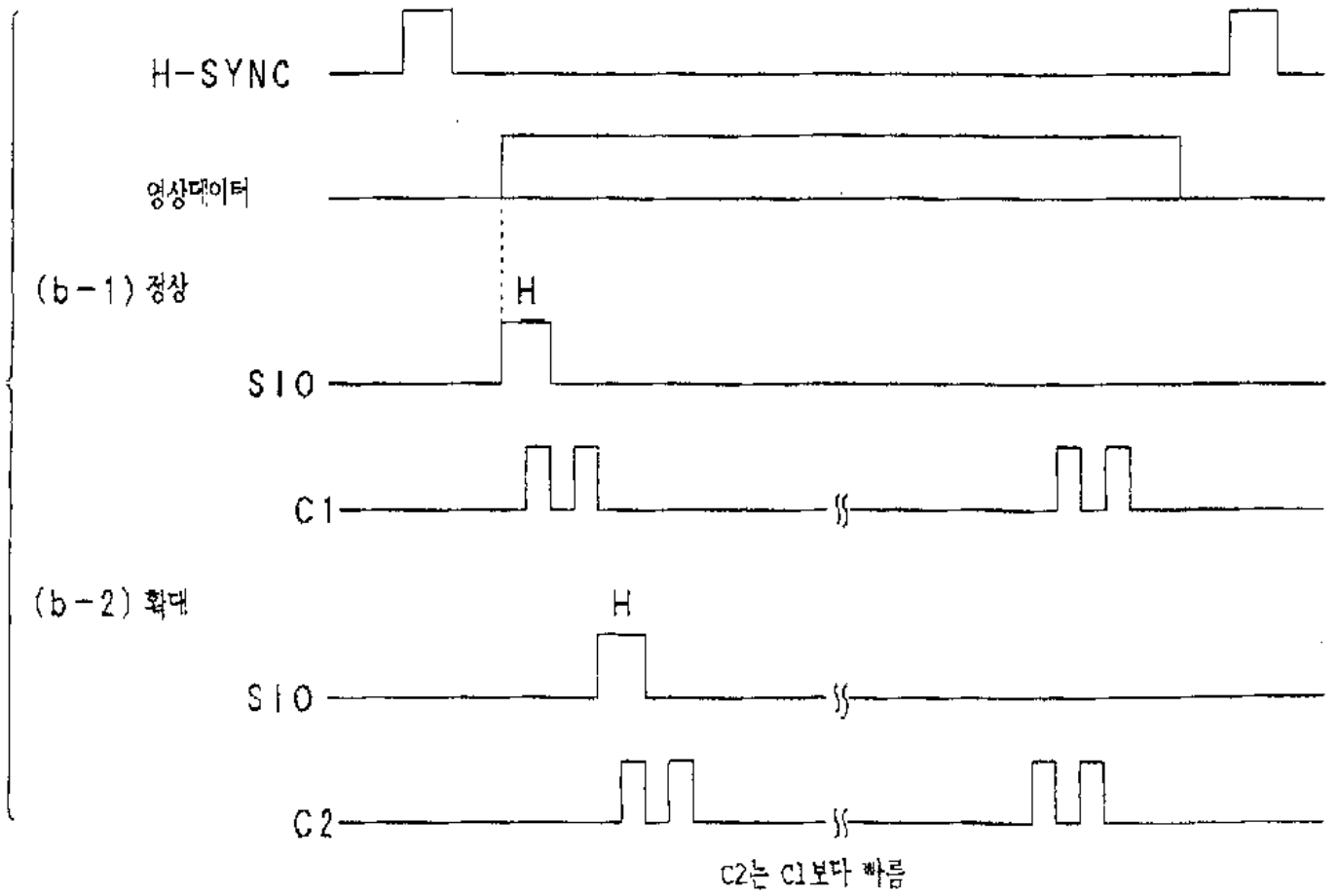


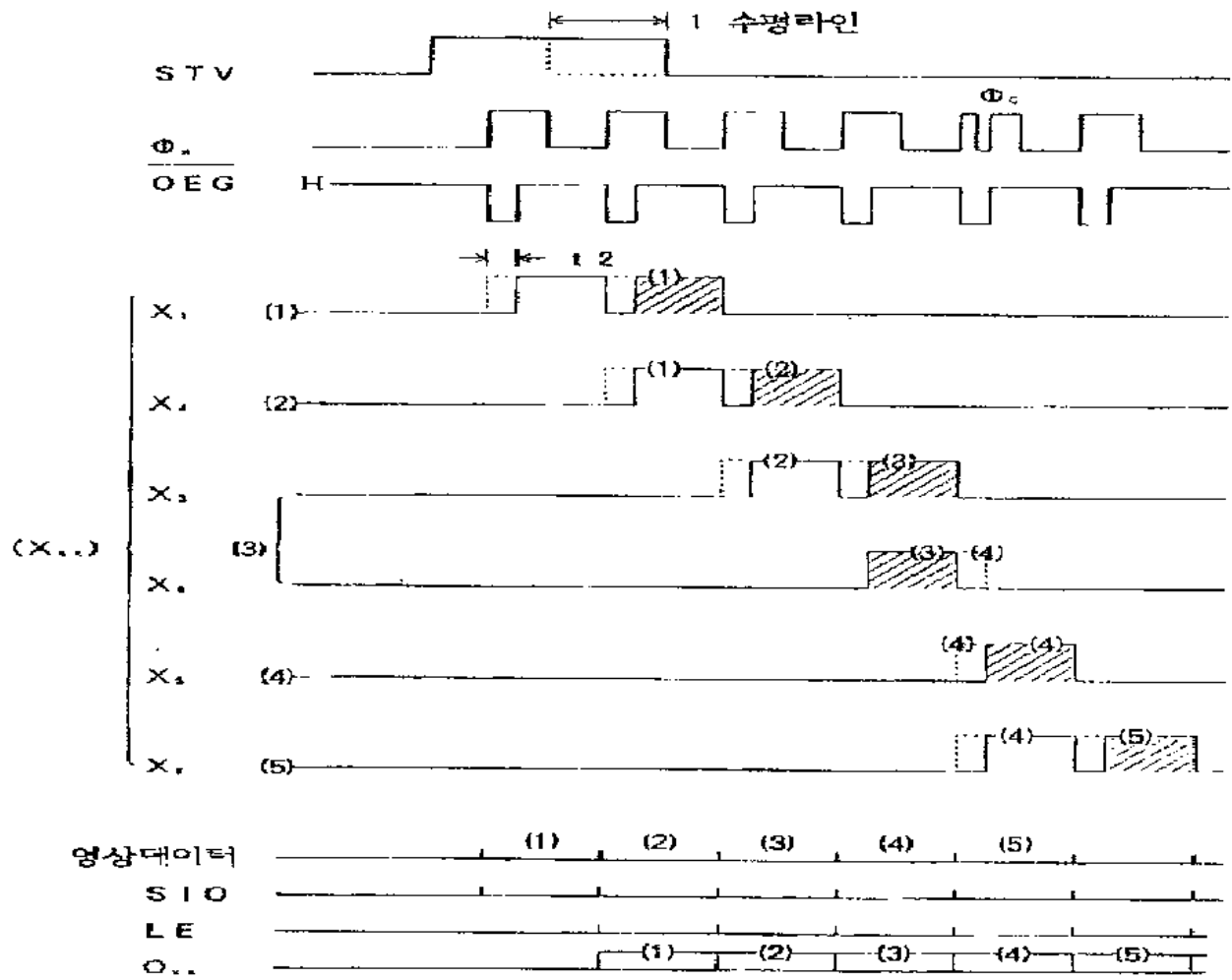


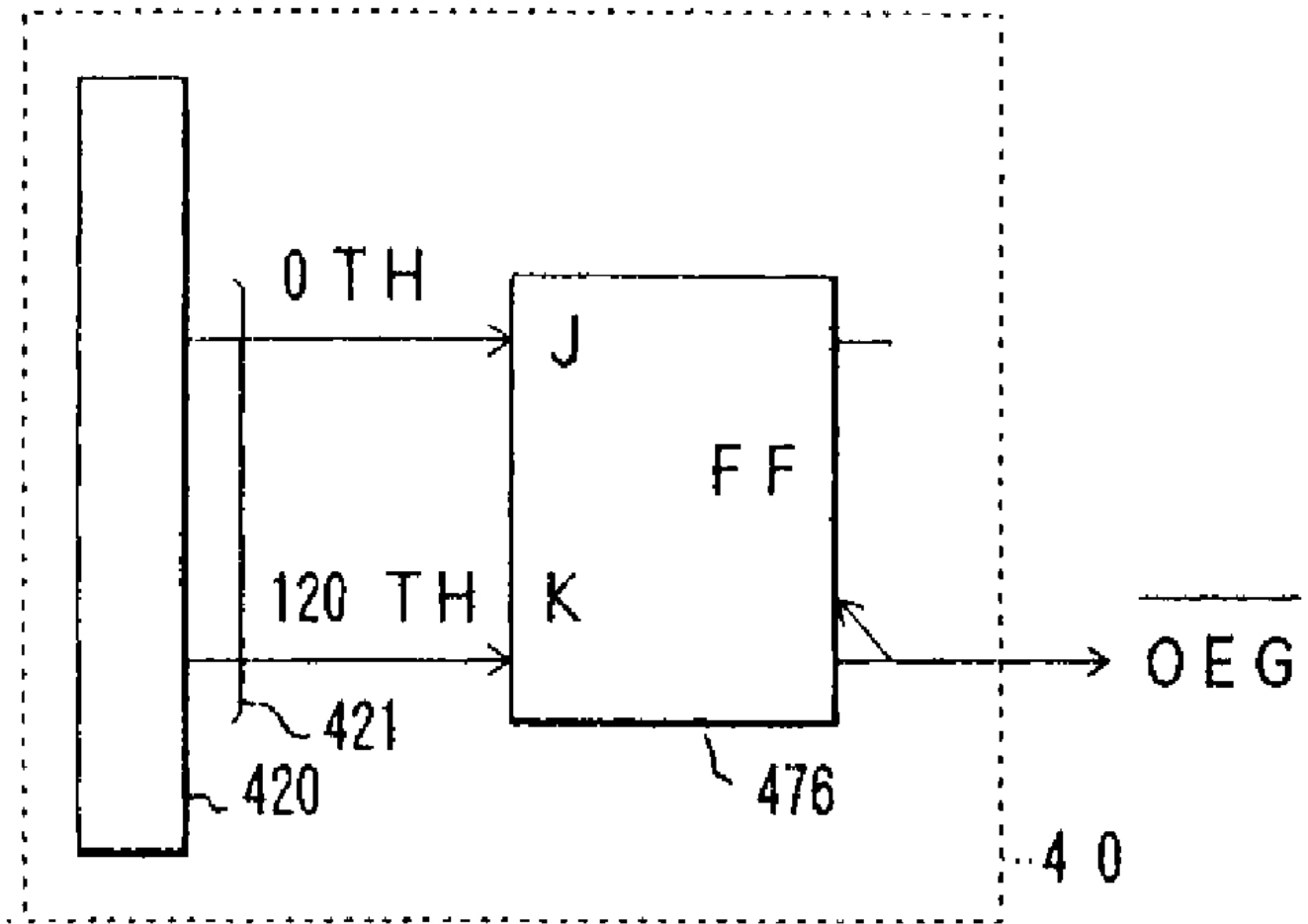


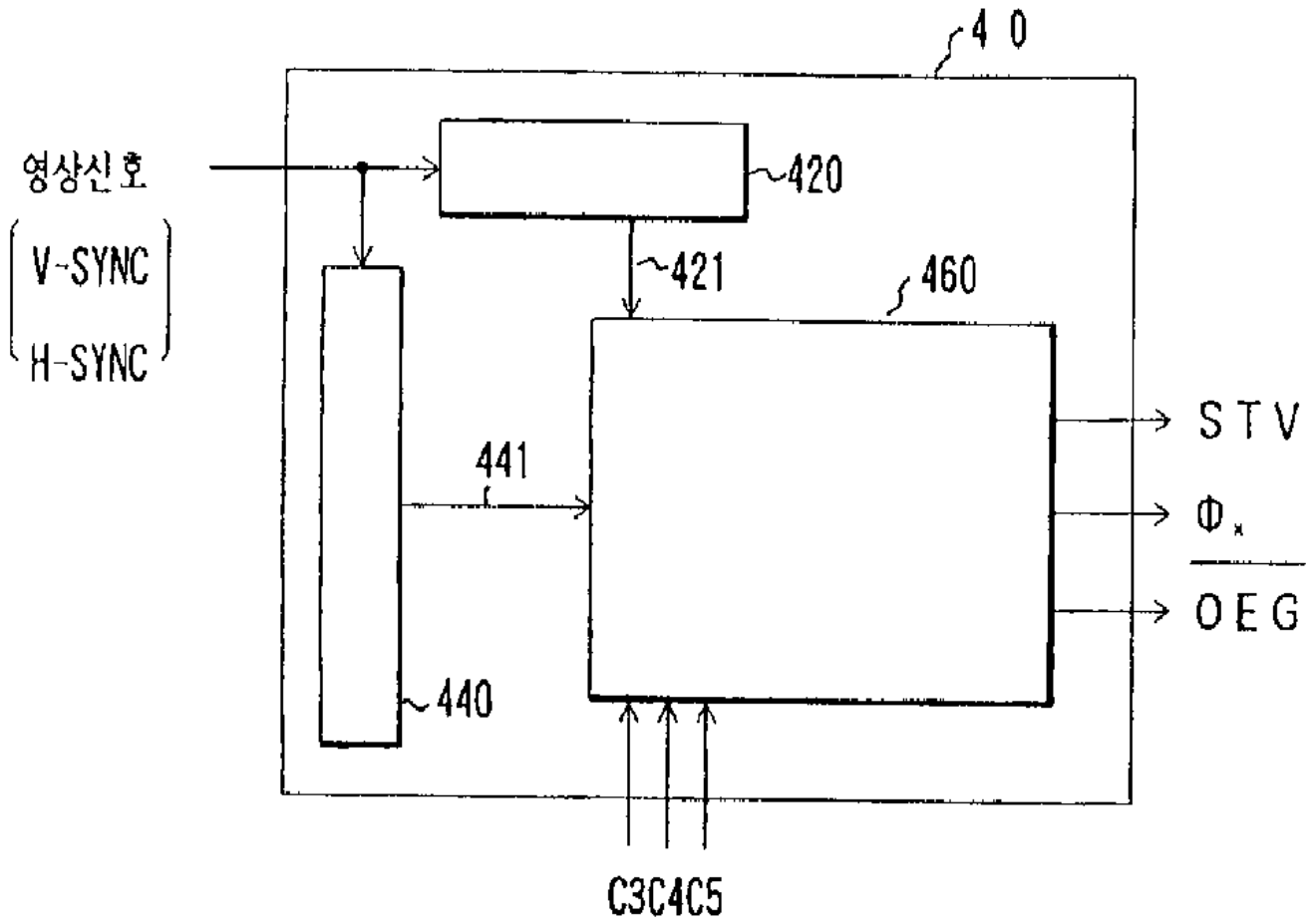


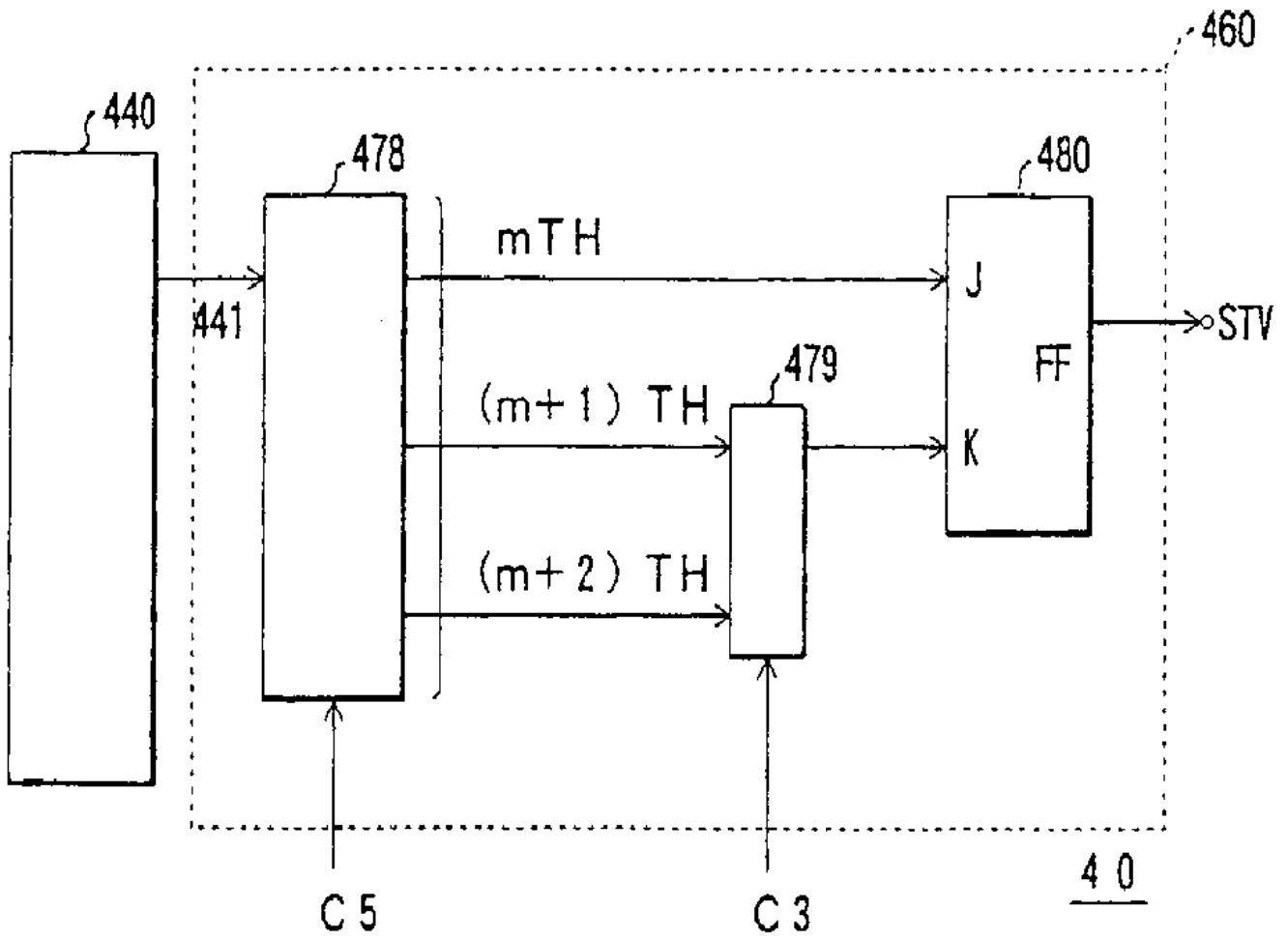




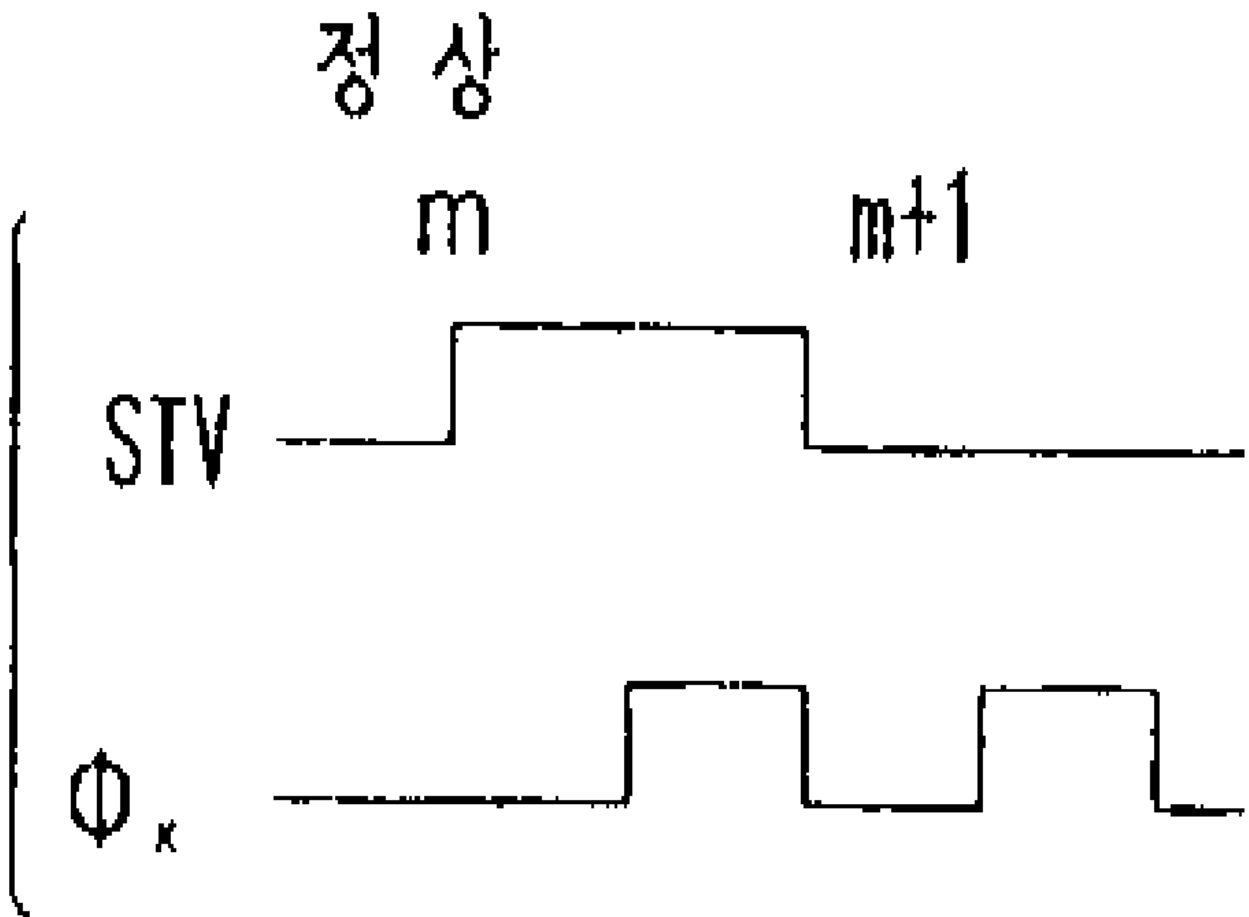




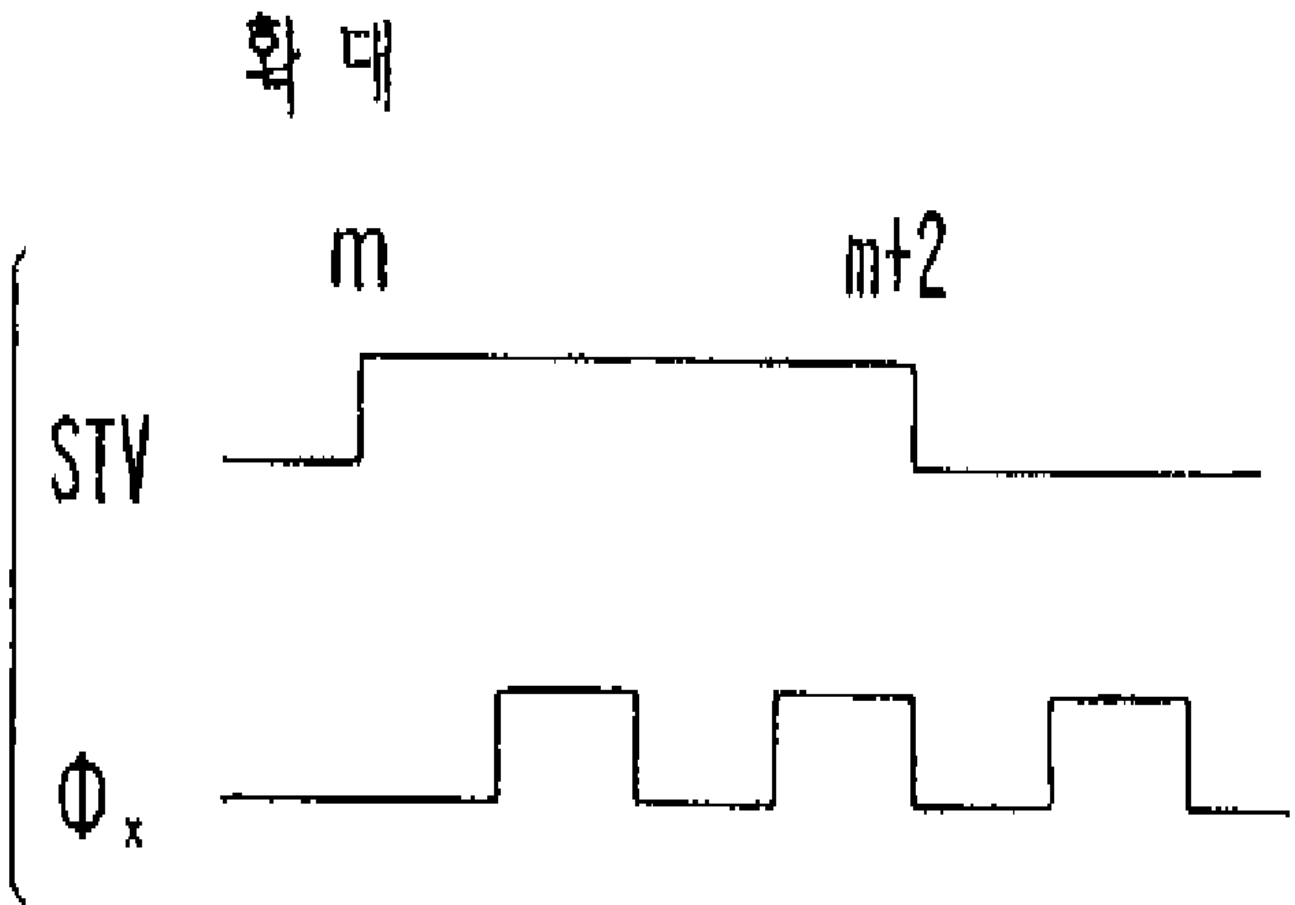


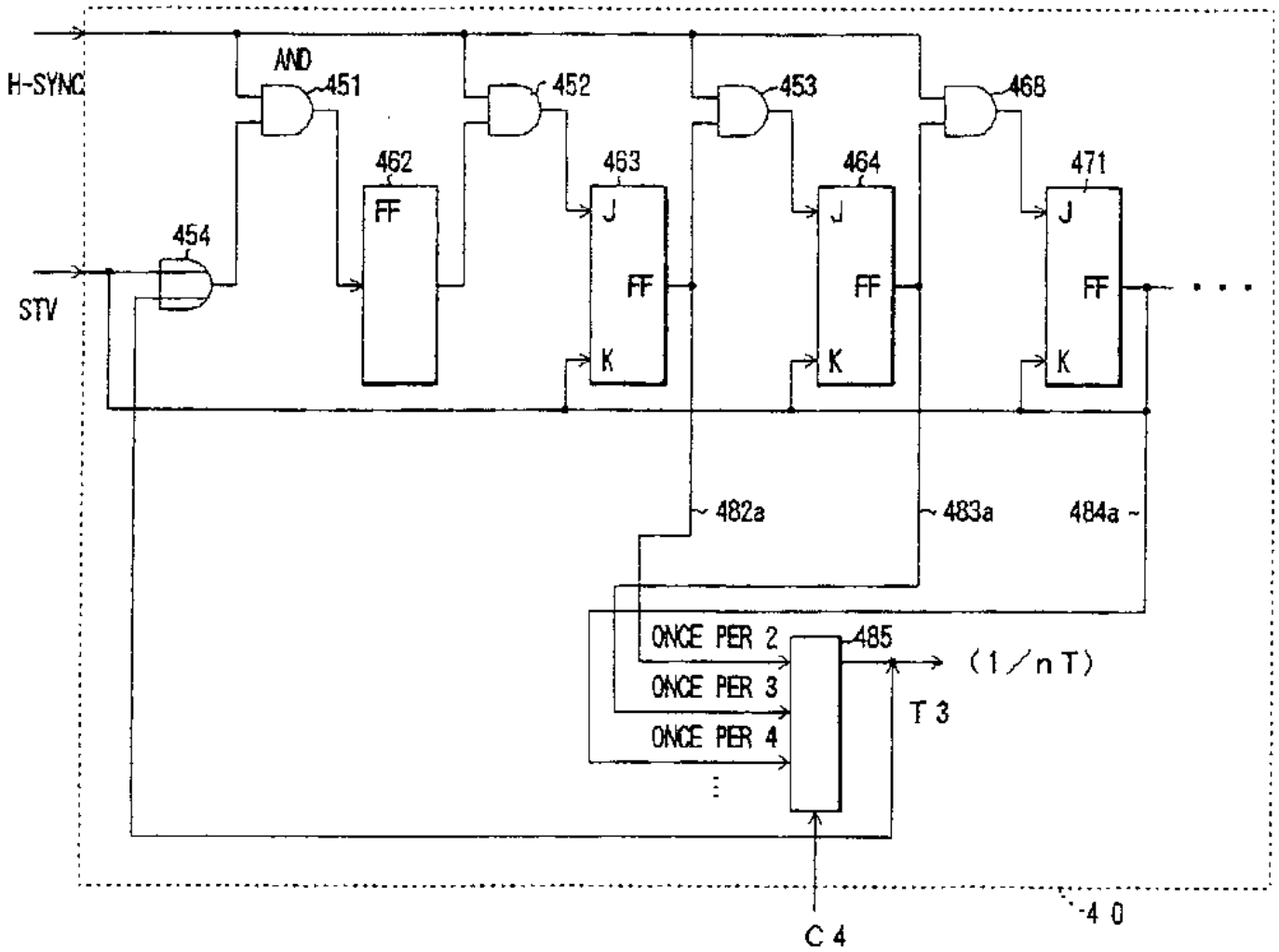


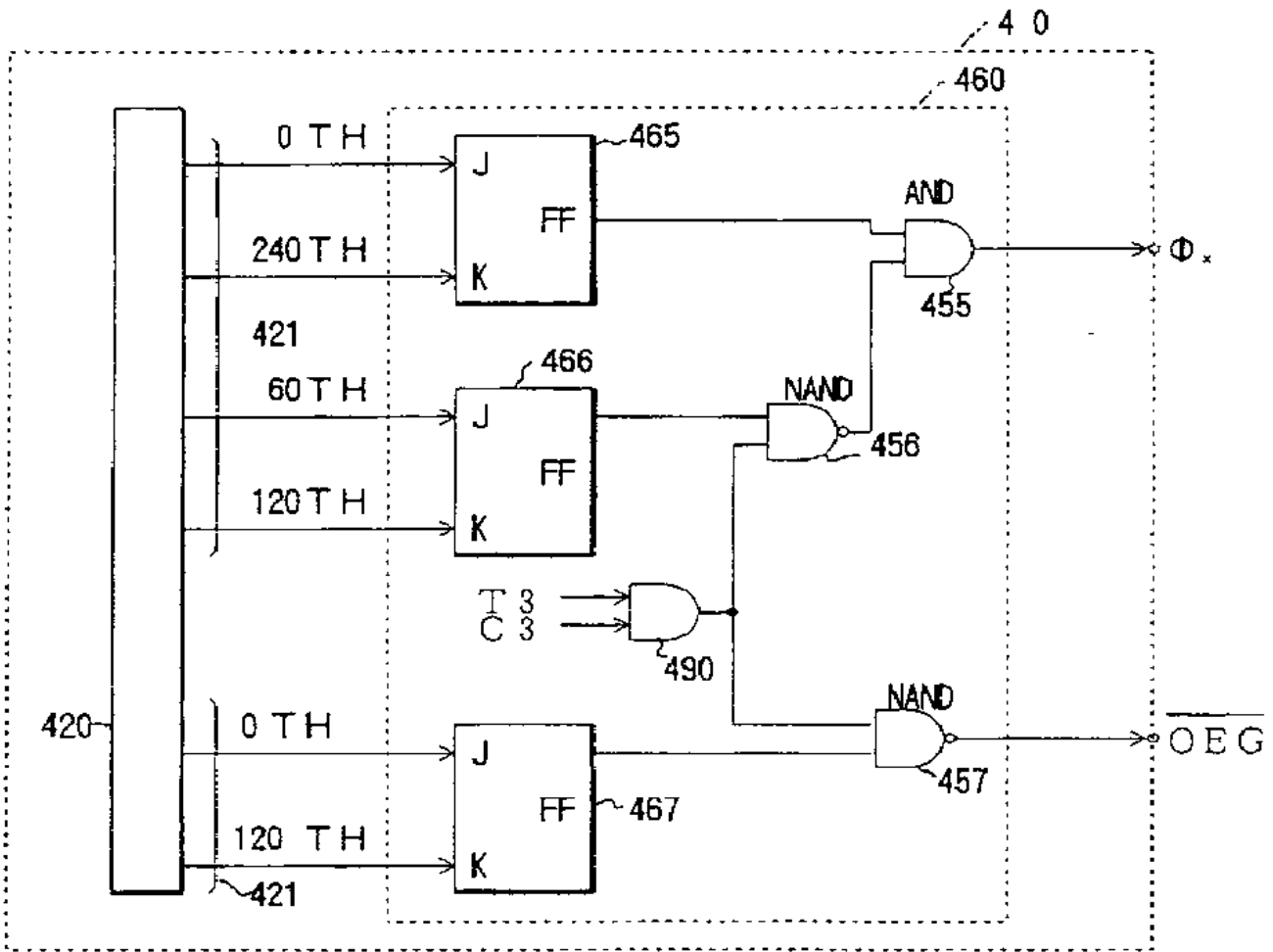
24a



24b

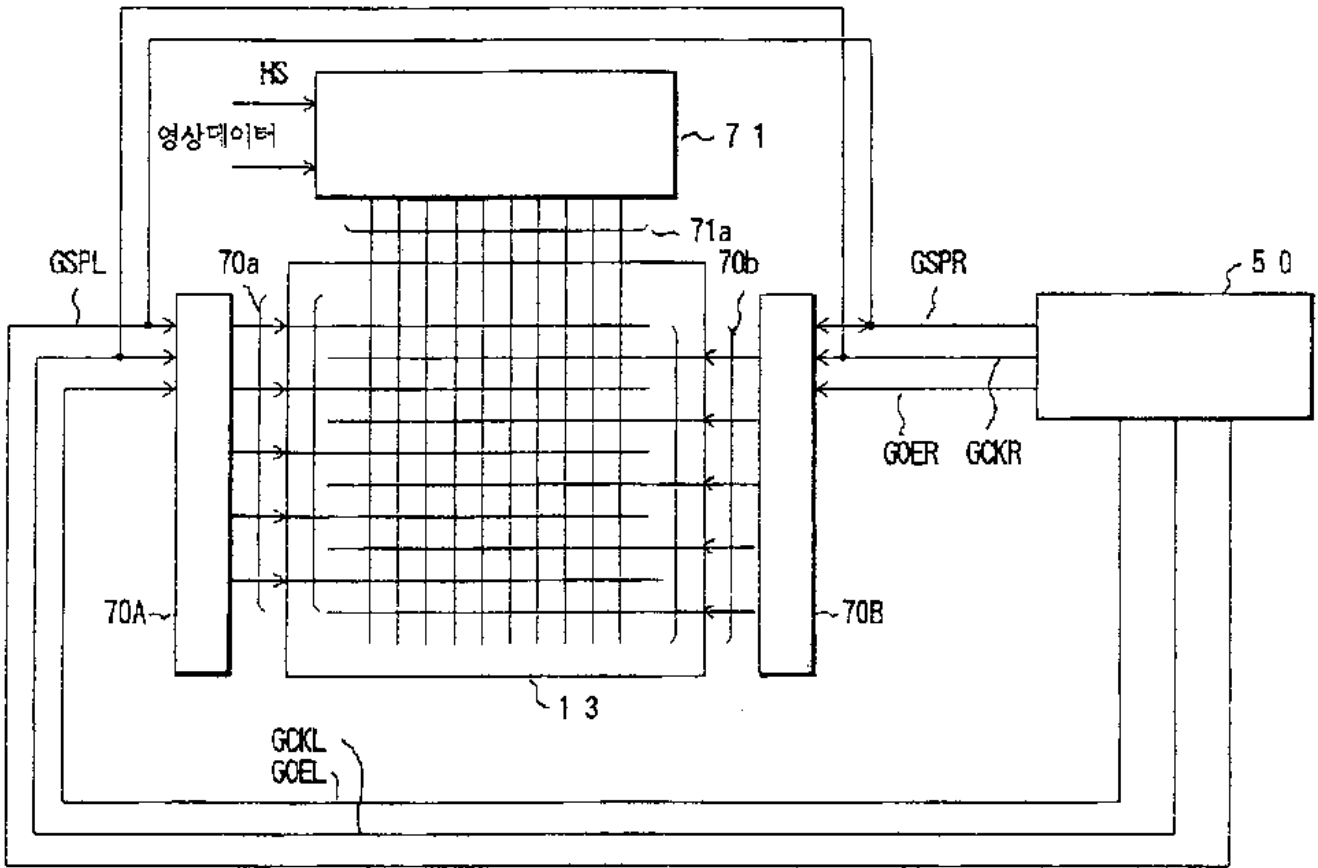


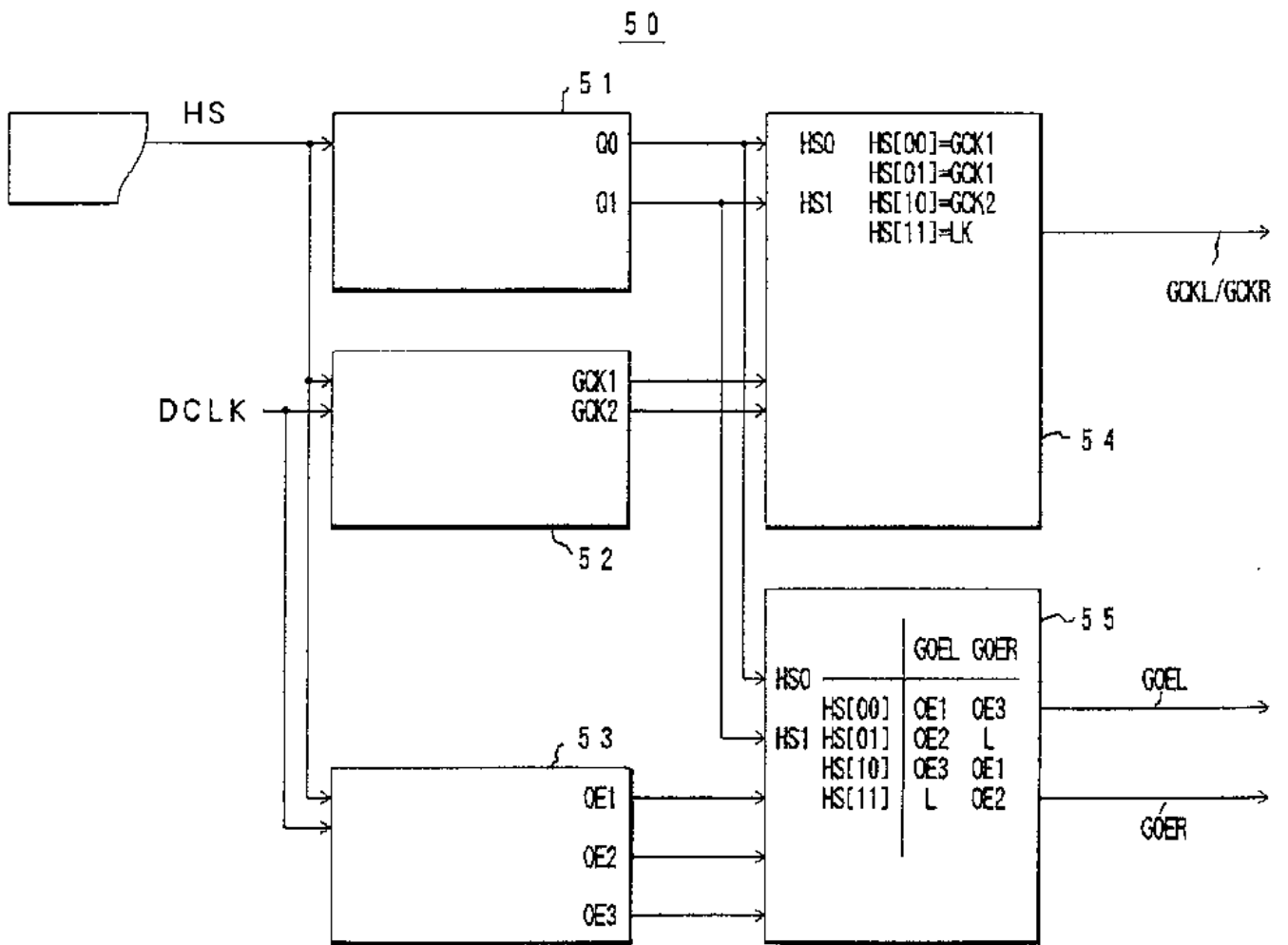


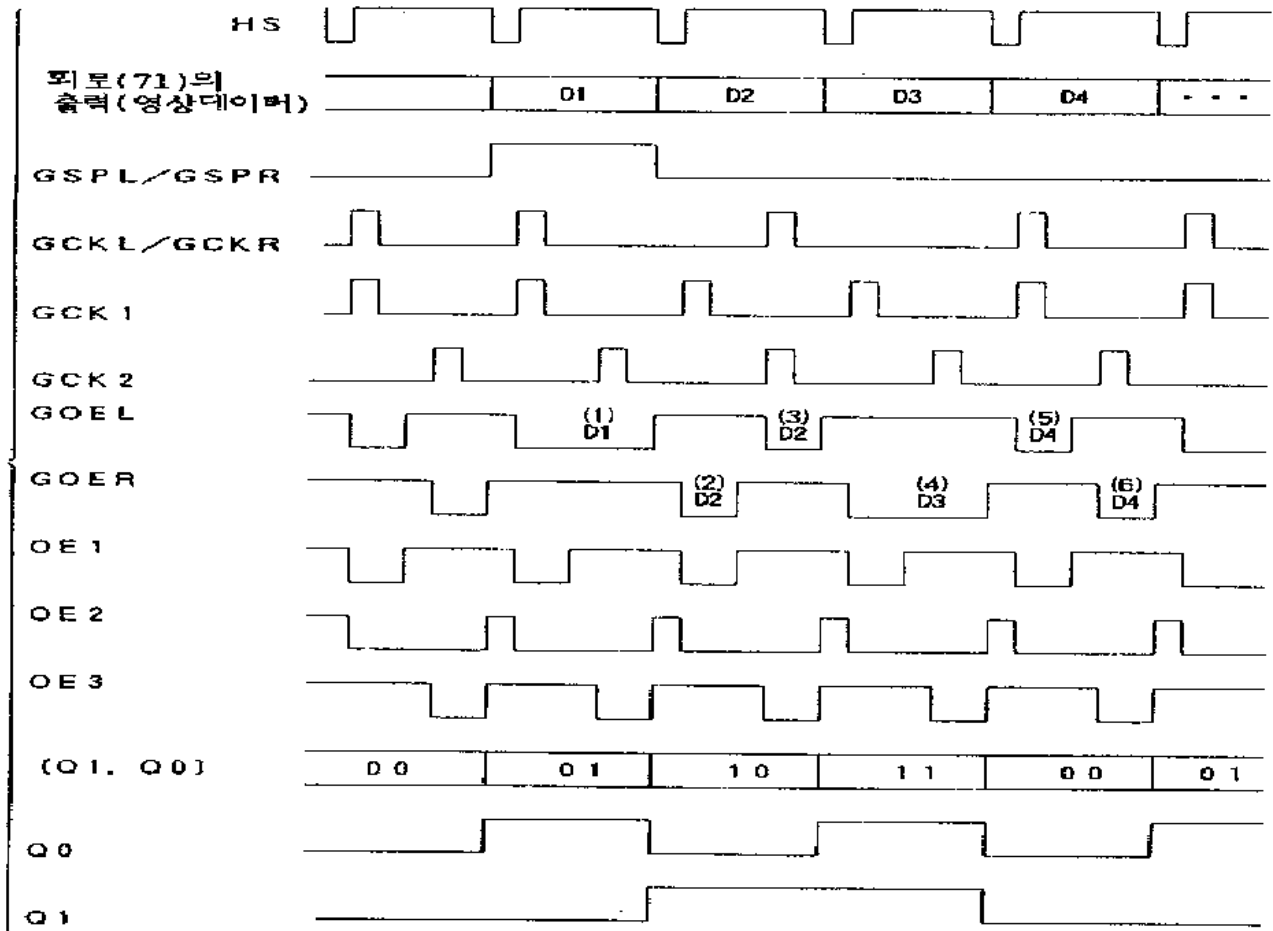


27

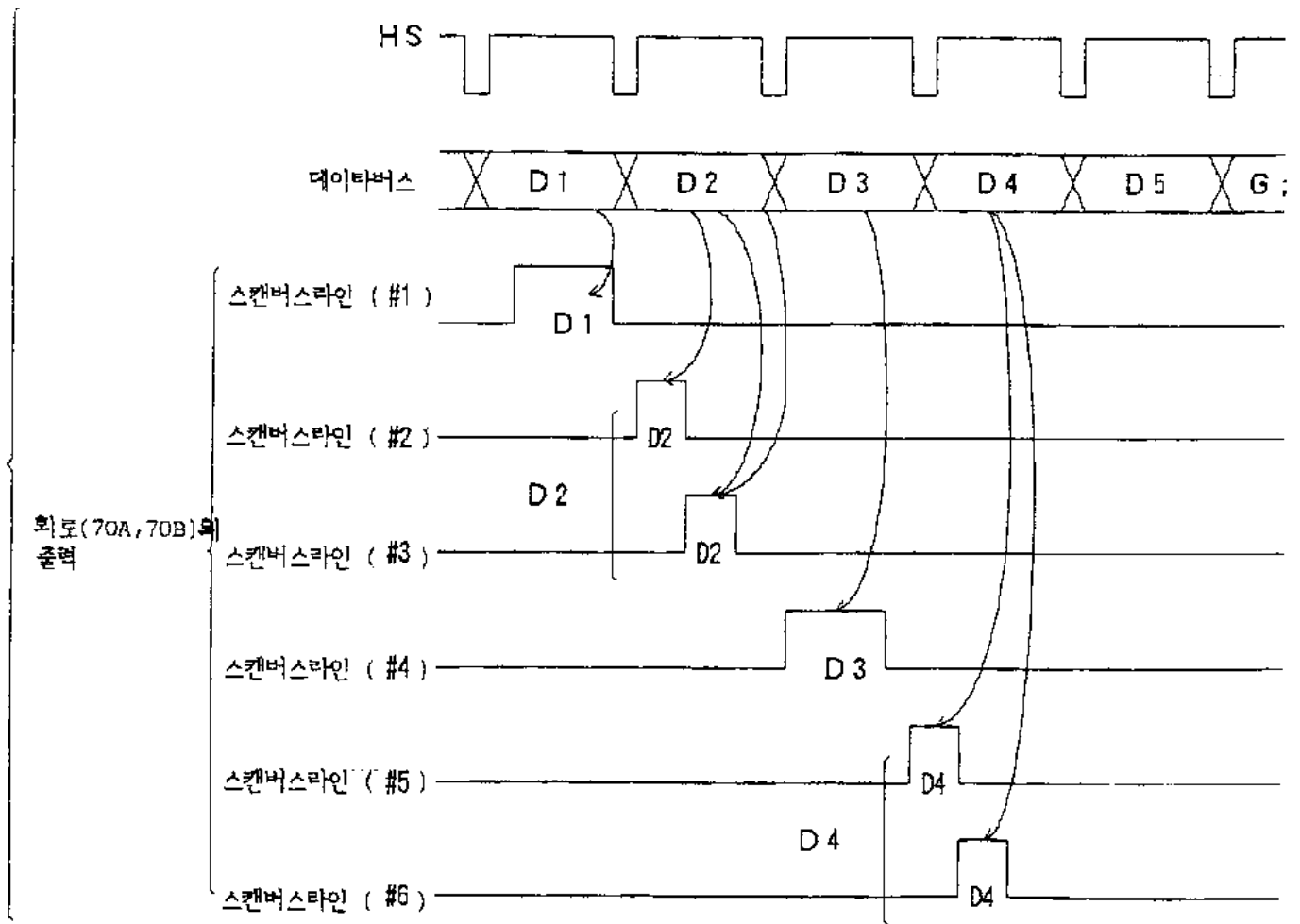
11





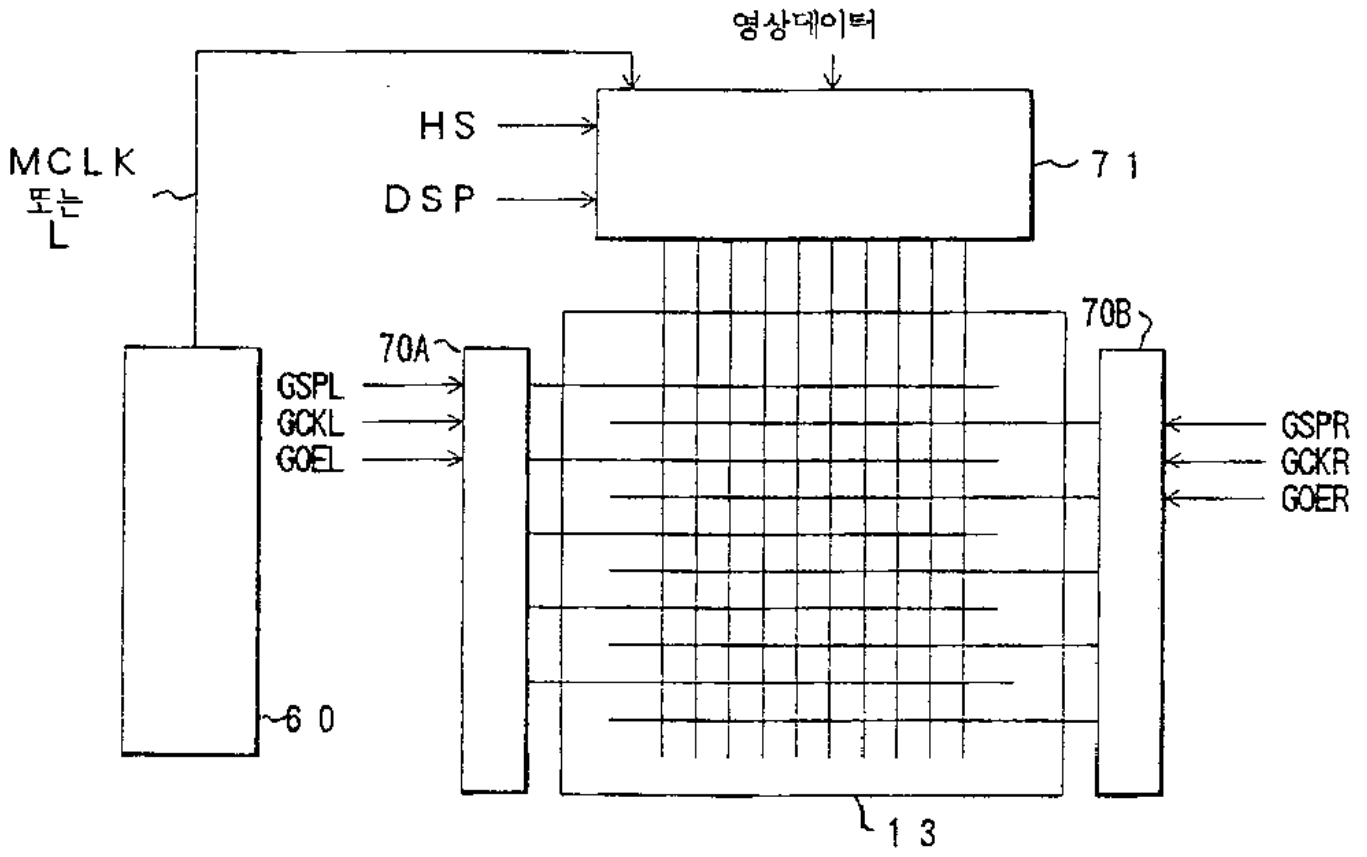


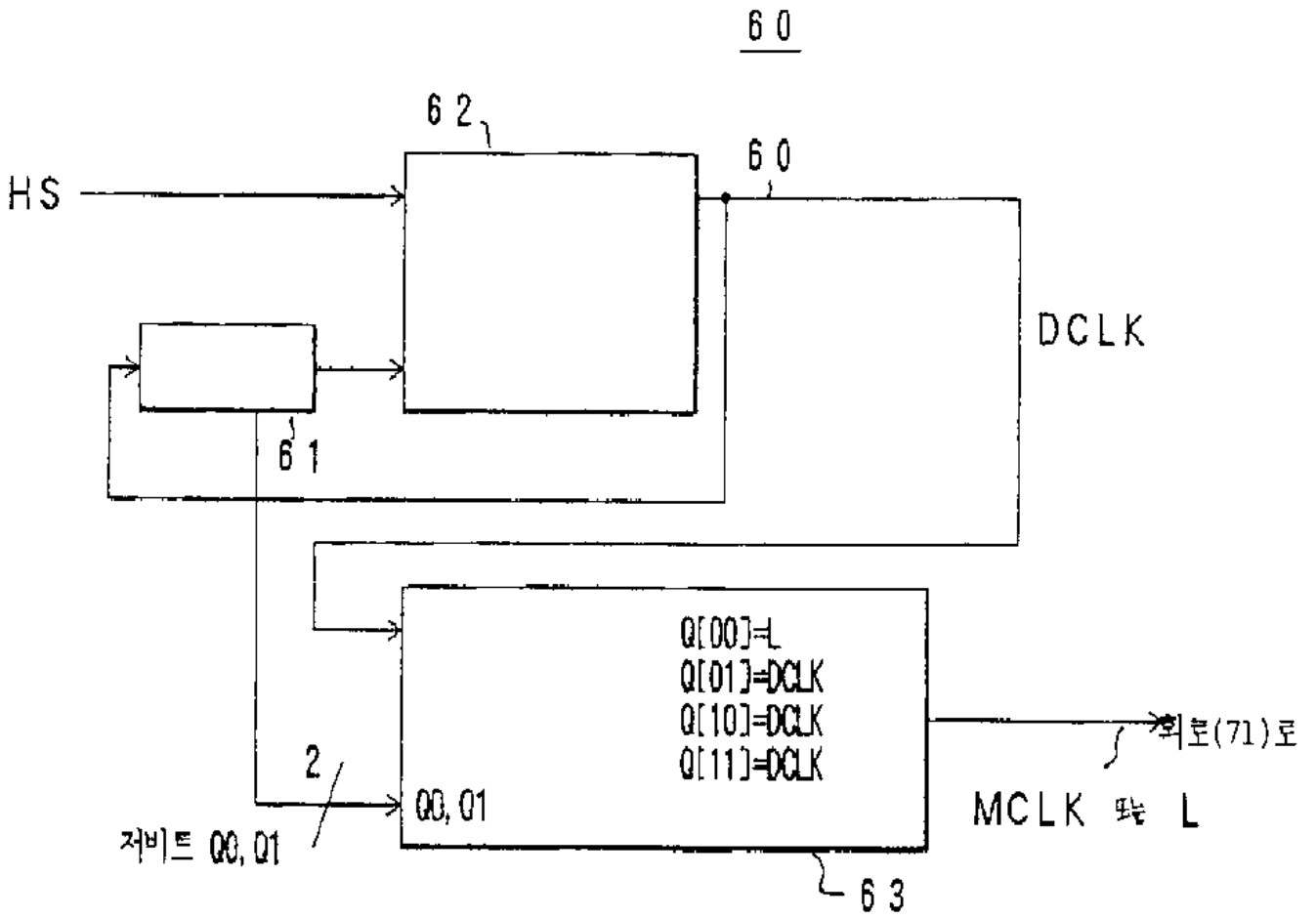
(1) ~ (6): 스캔버스타인 (#1~#6)

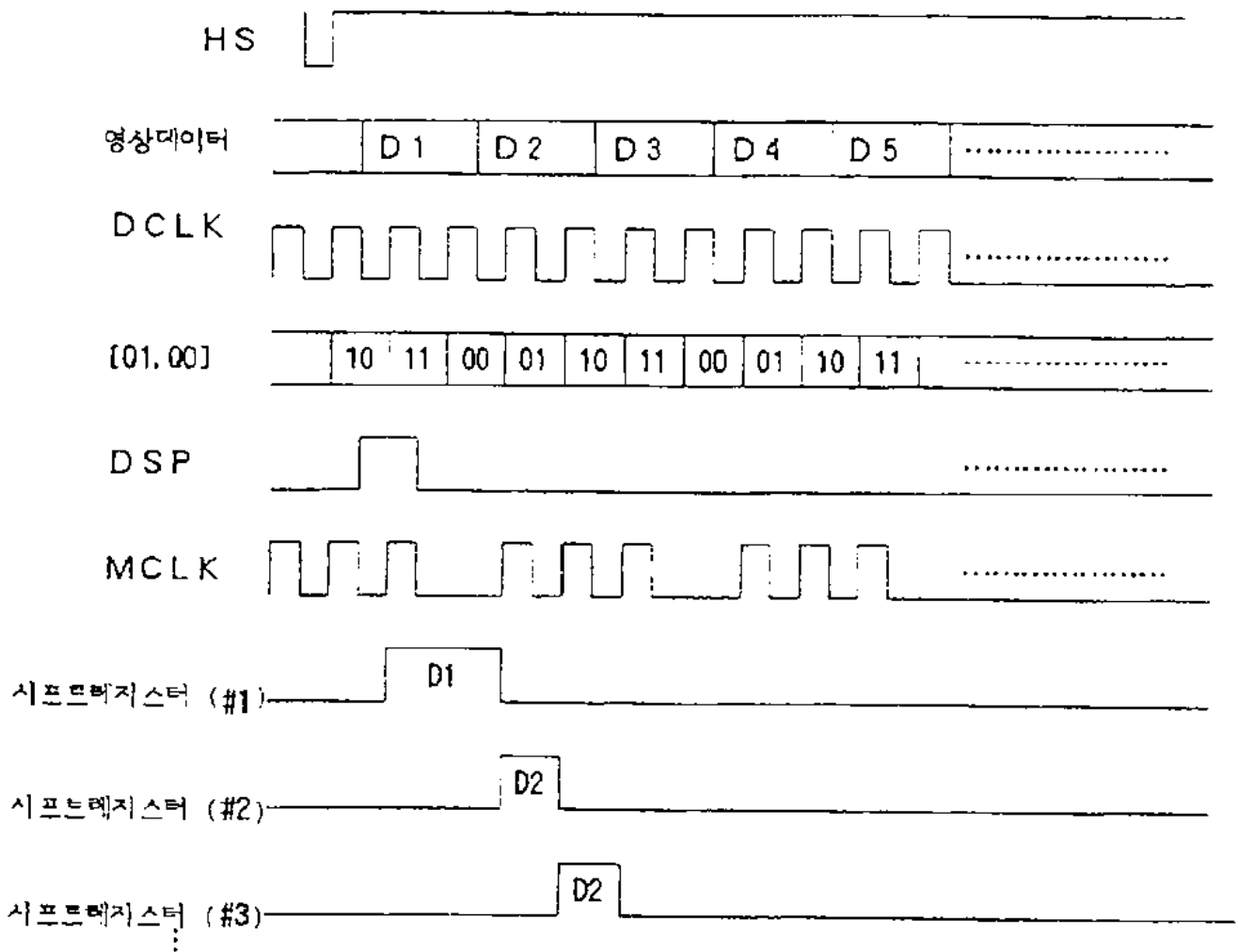


31

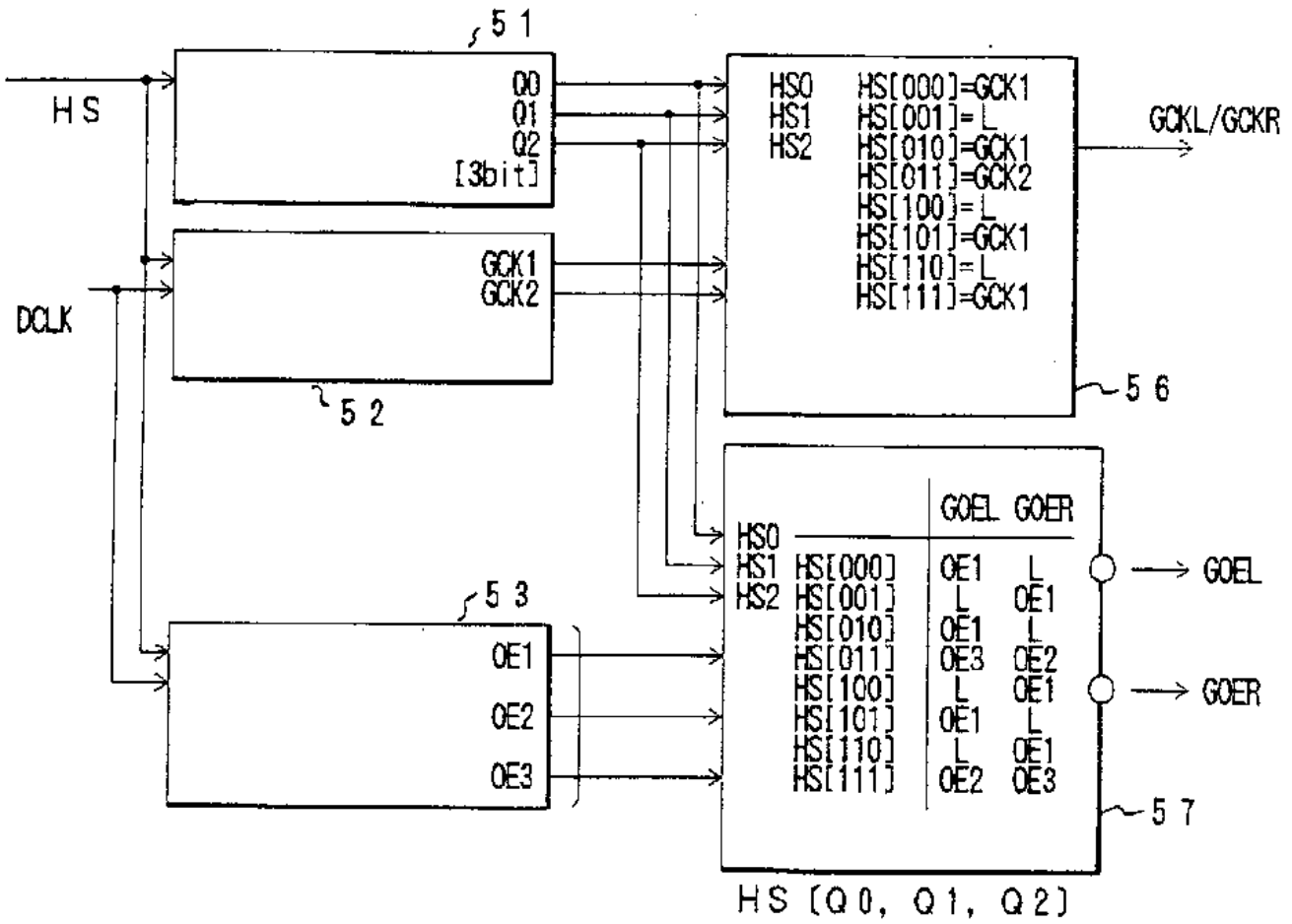
11

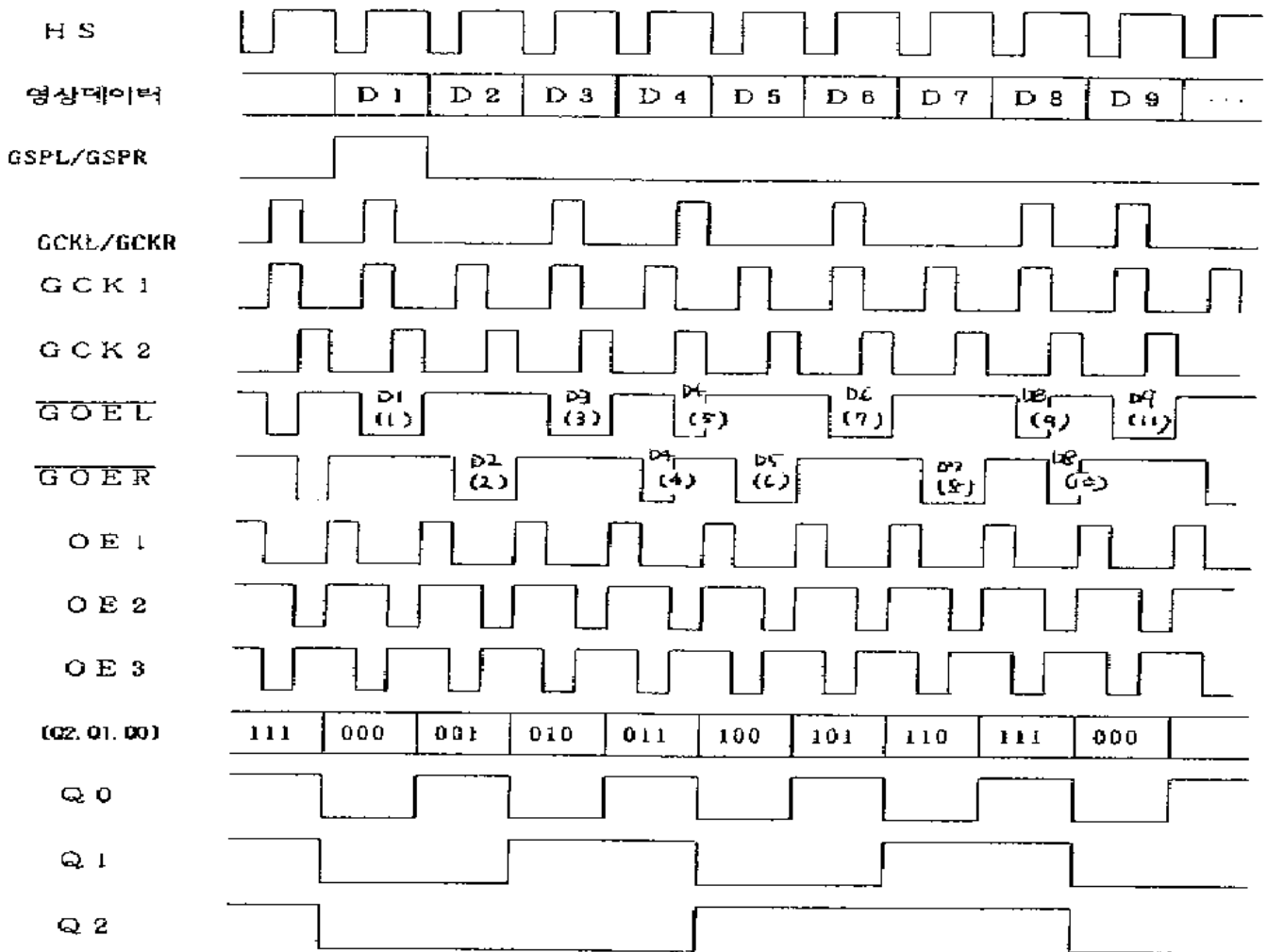


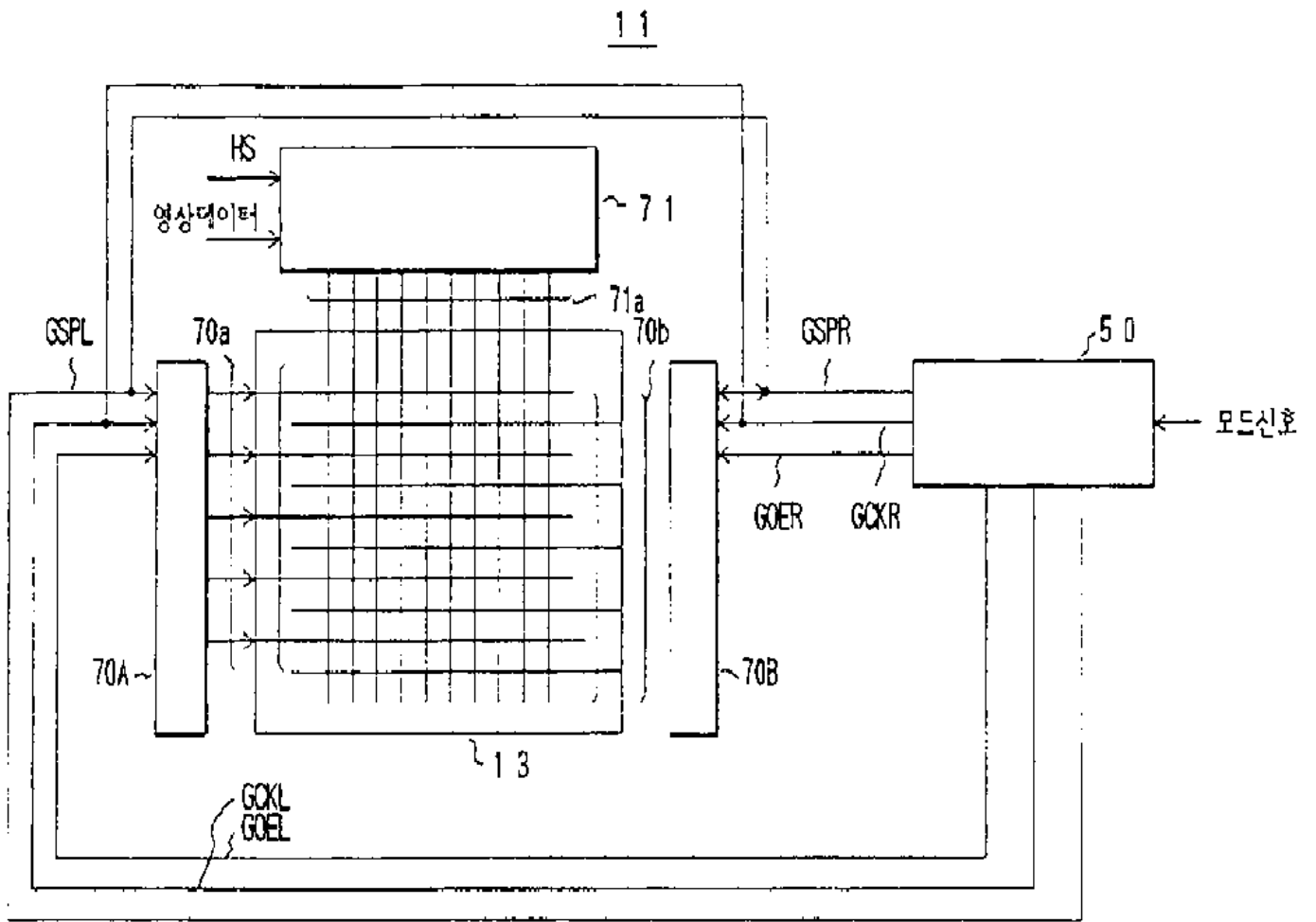


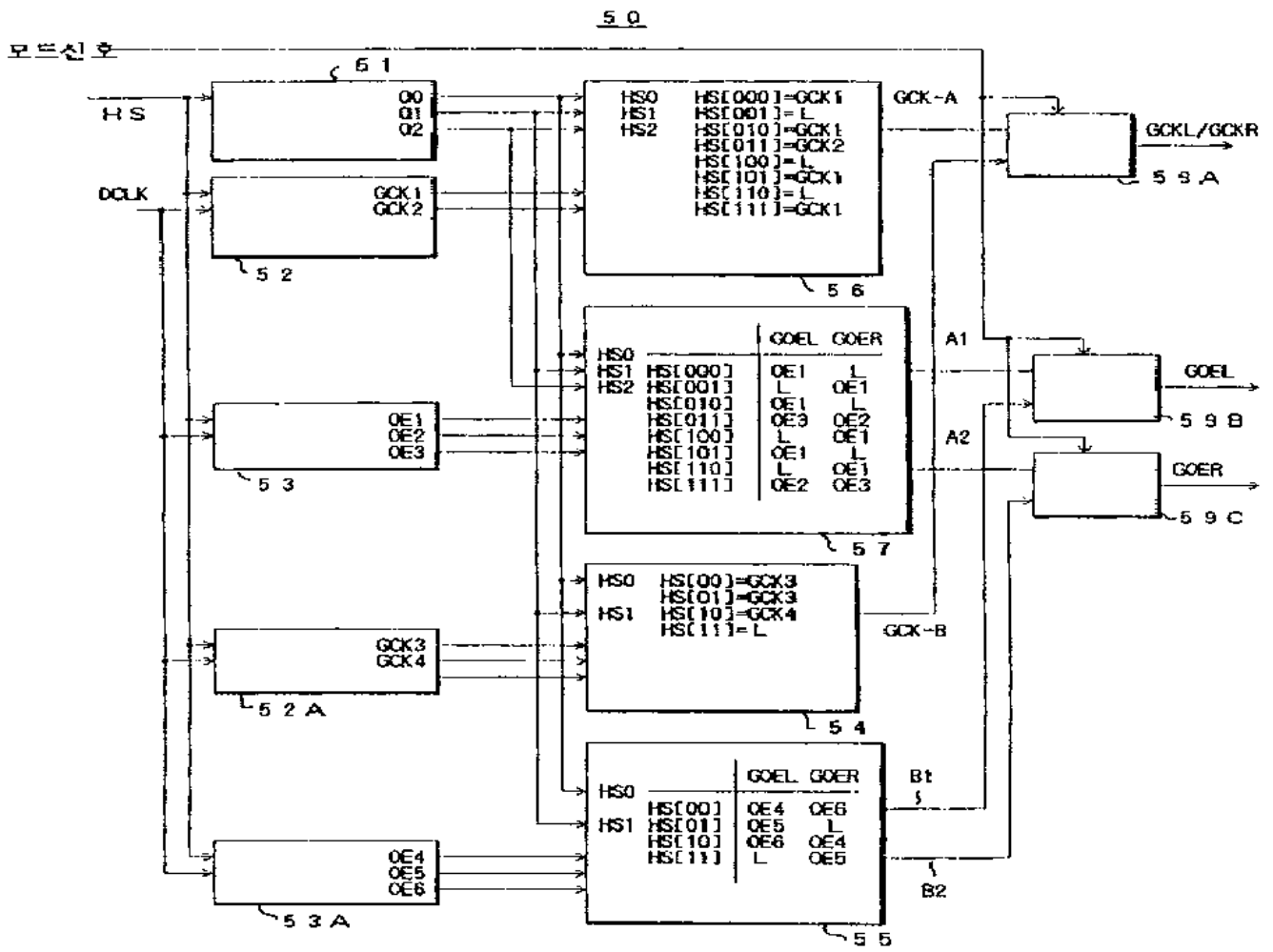


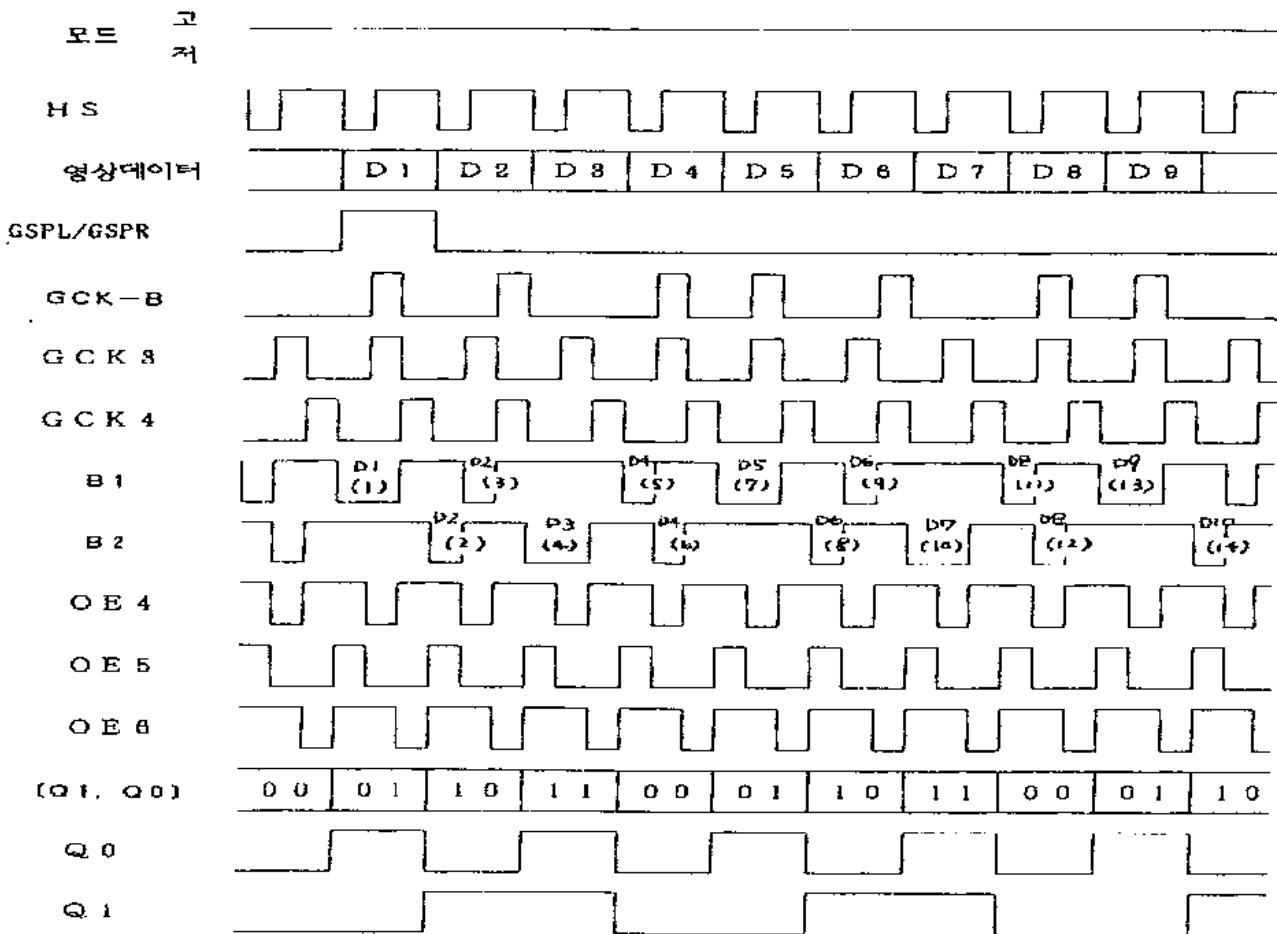
5 0

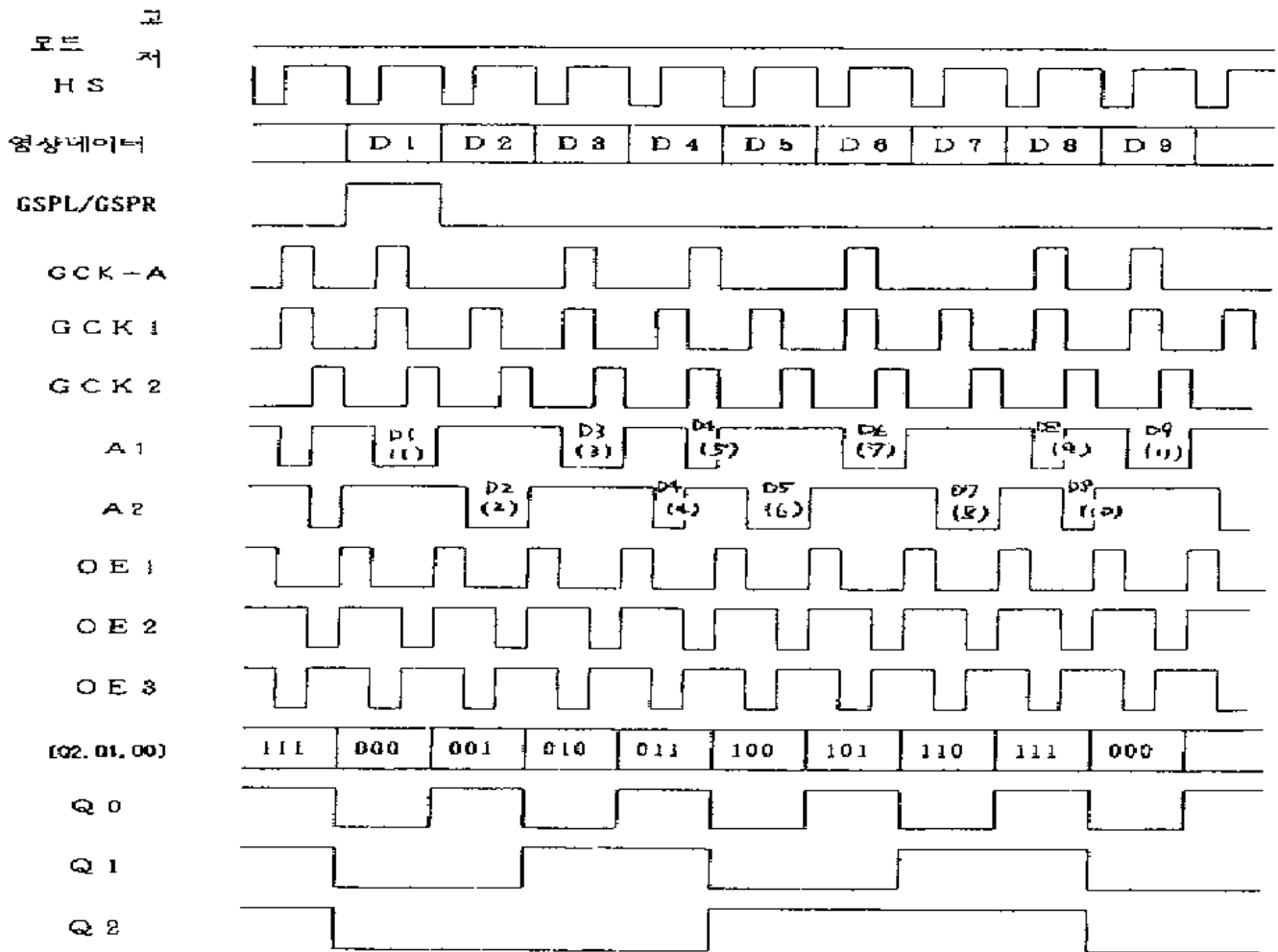




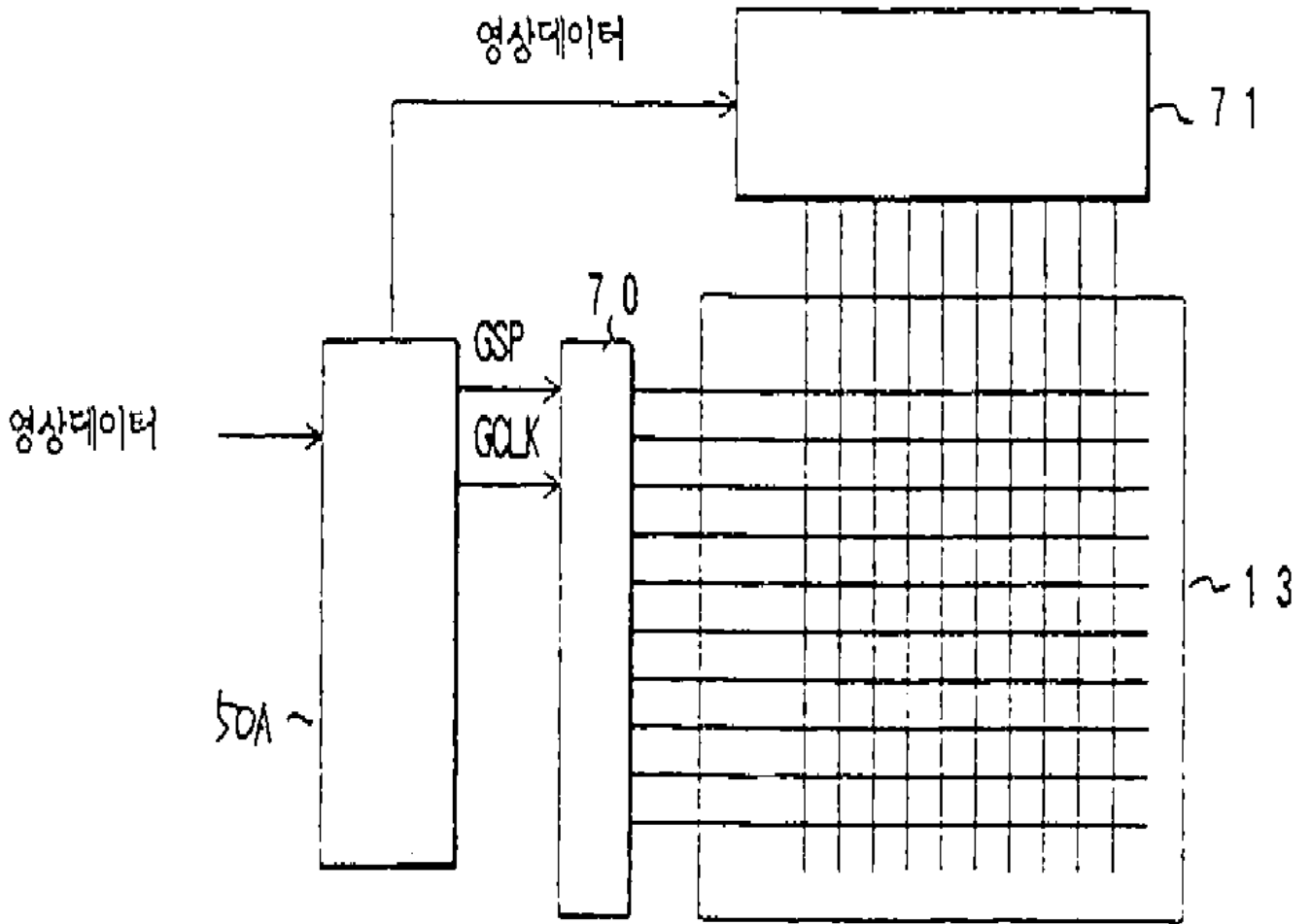




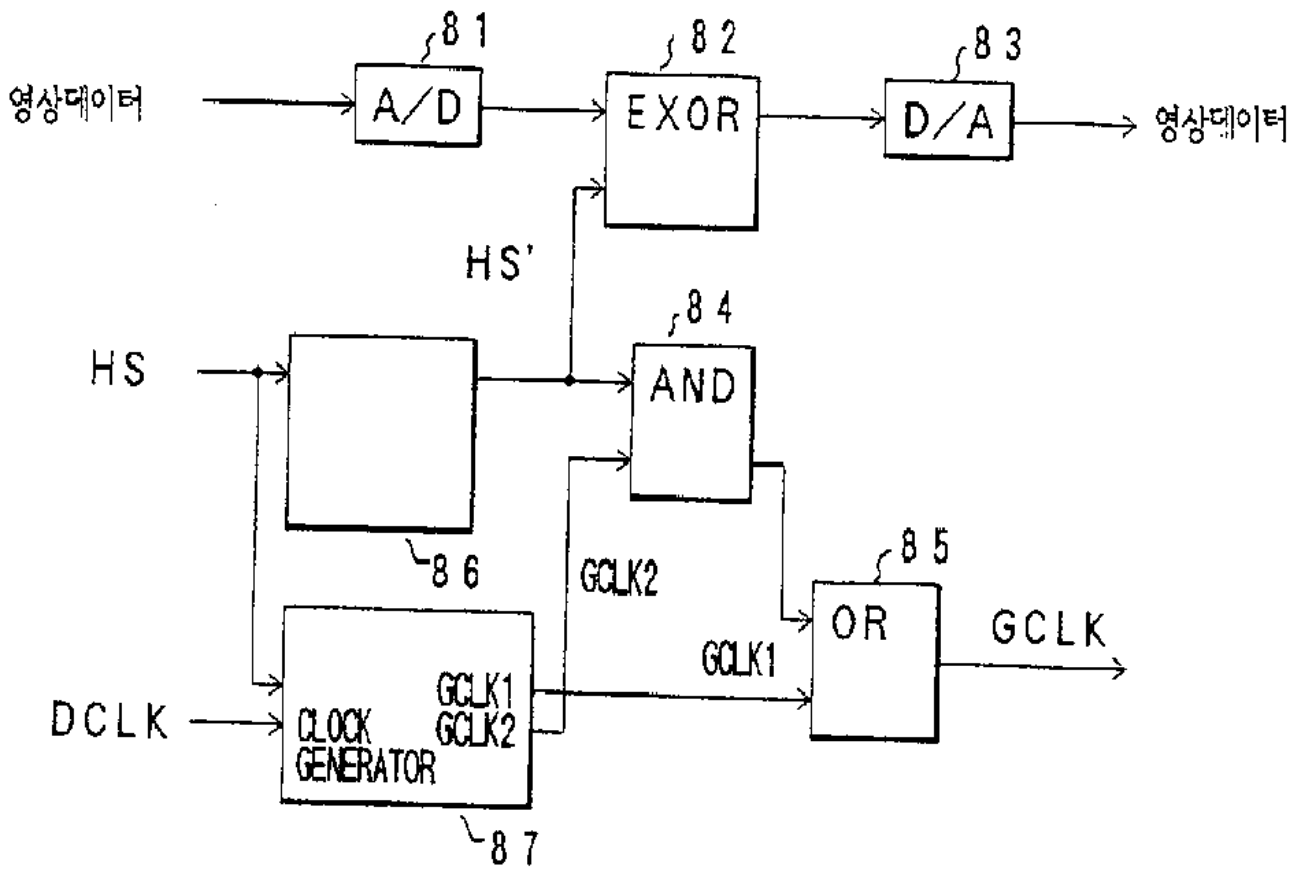




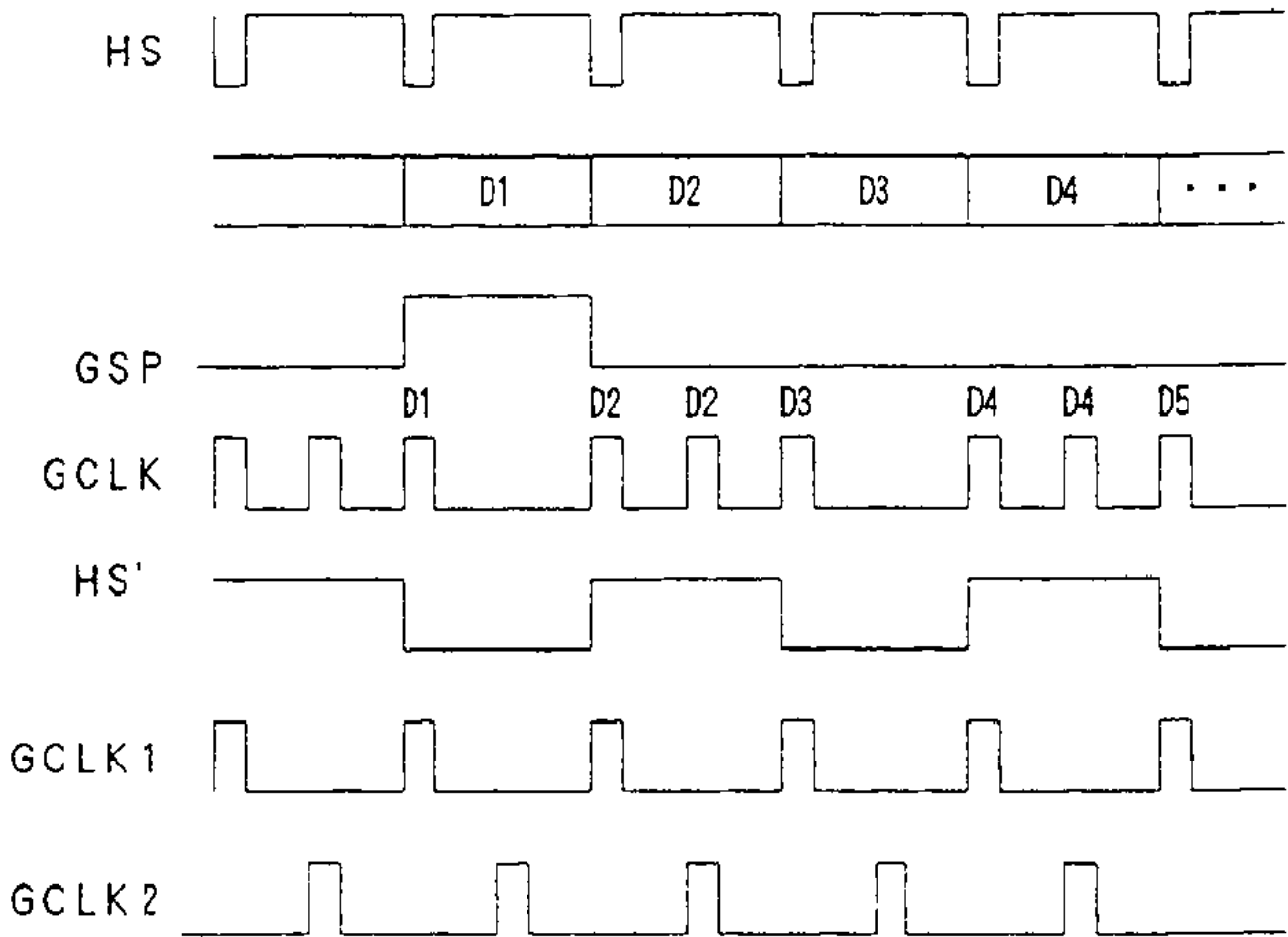
40



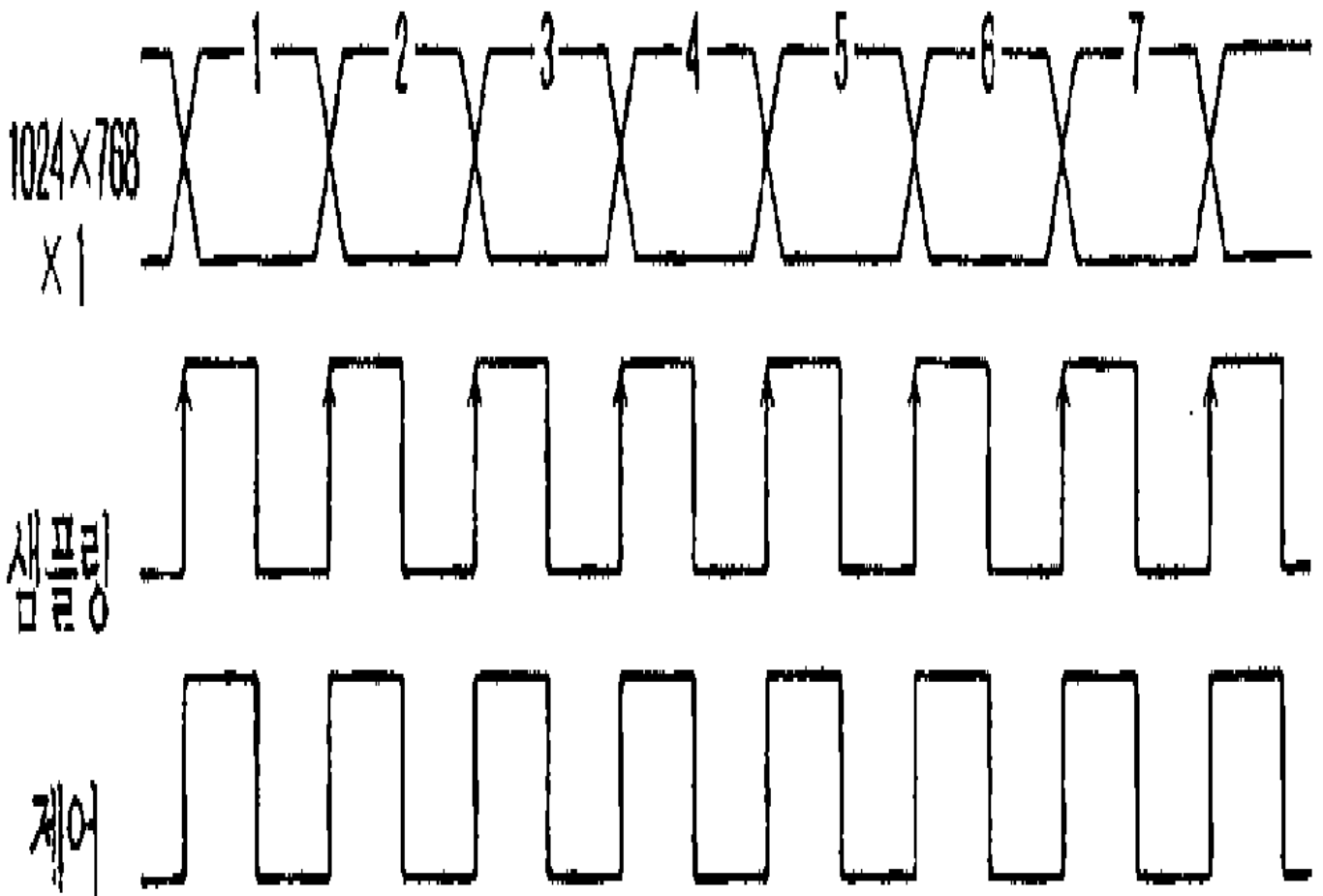
50A



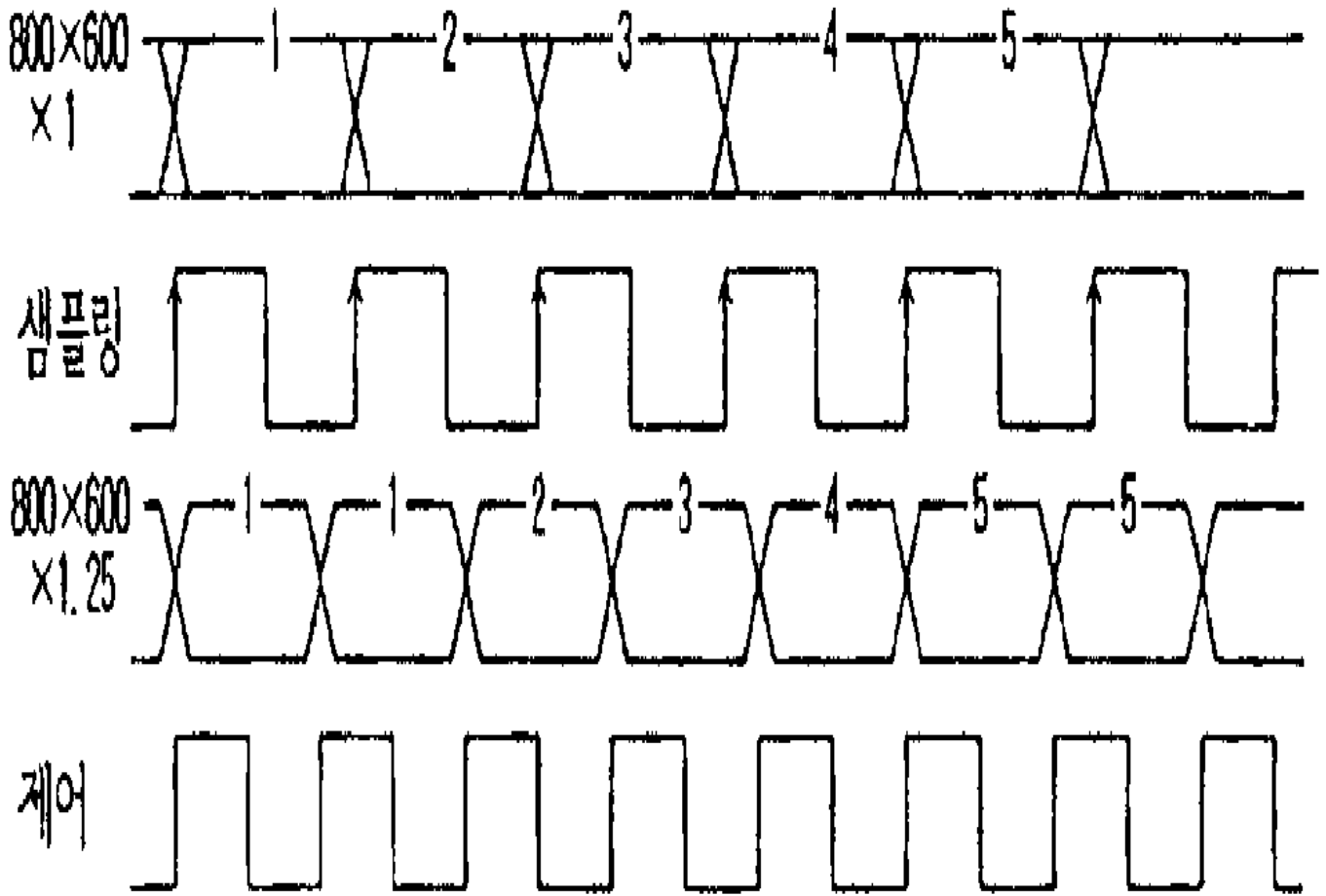
42



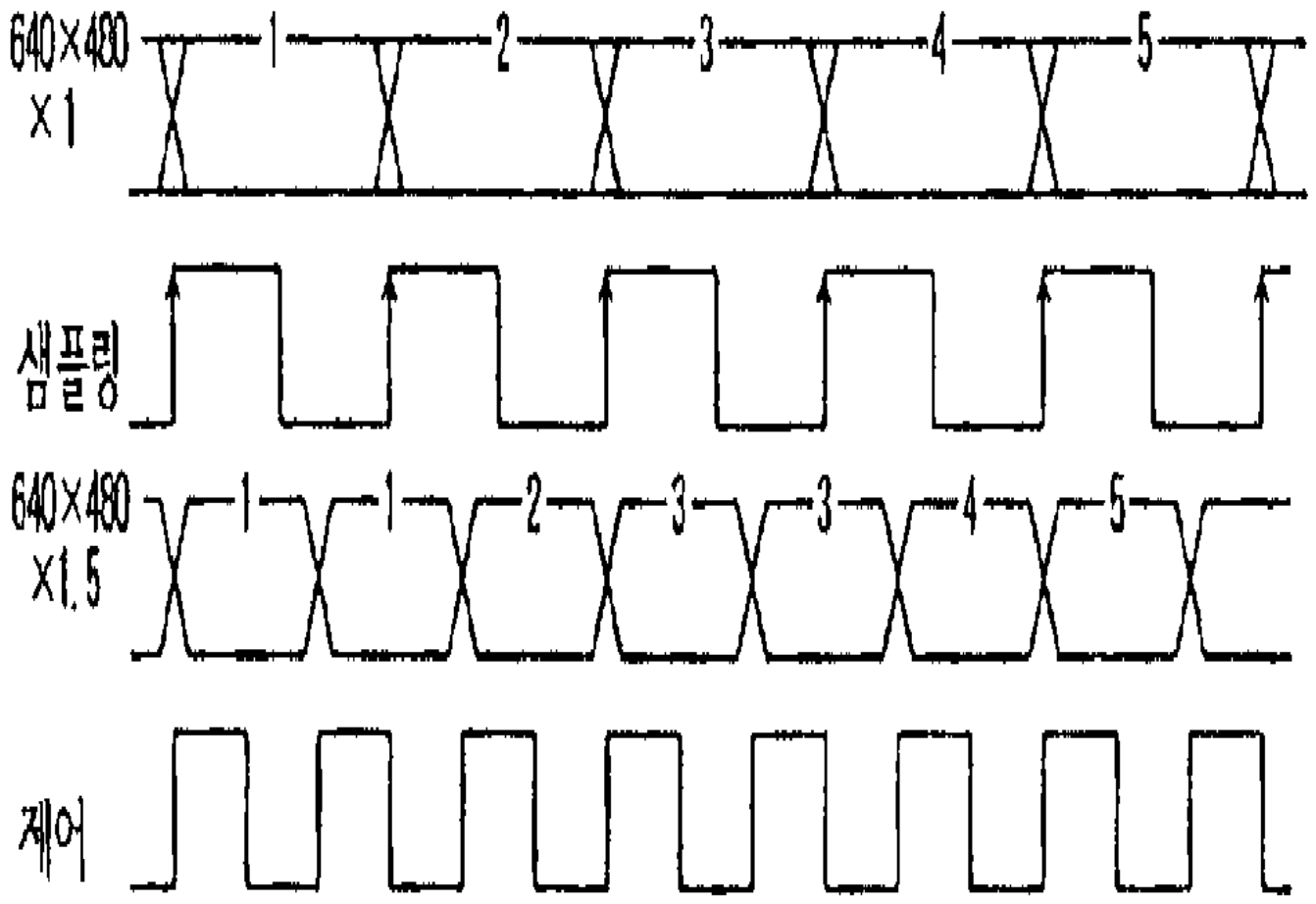
43a

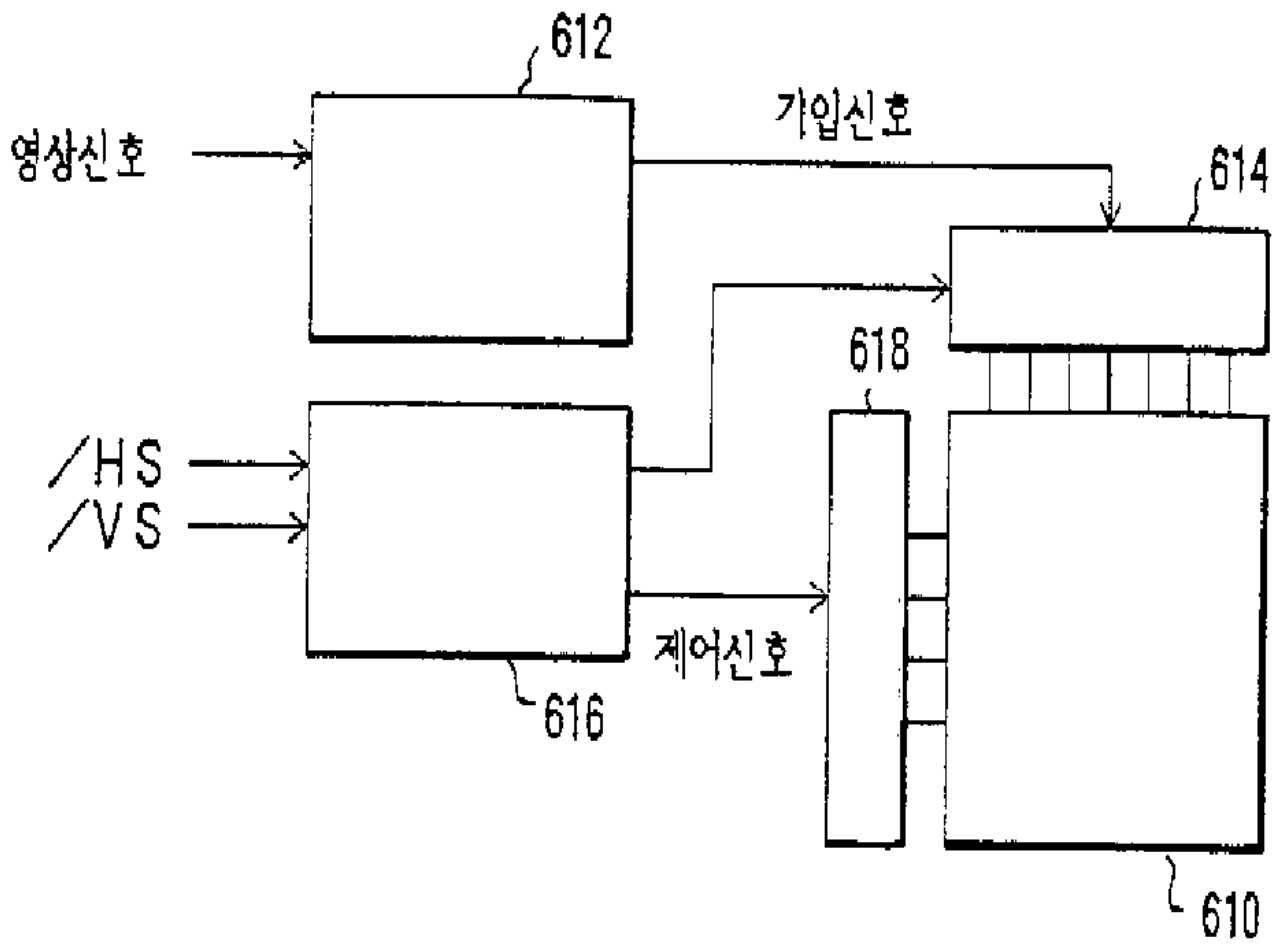


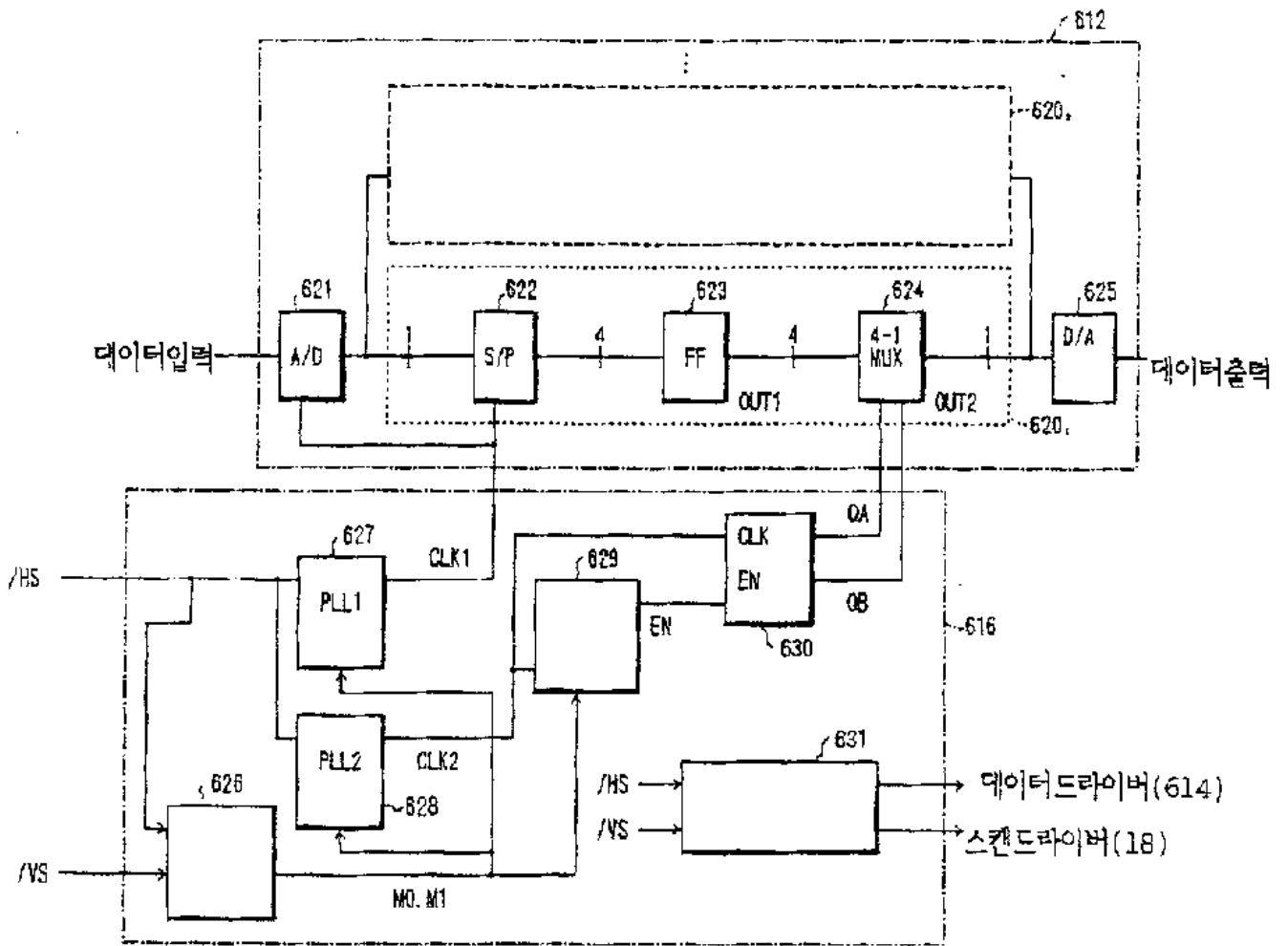
43b



43c



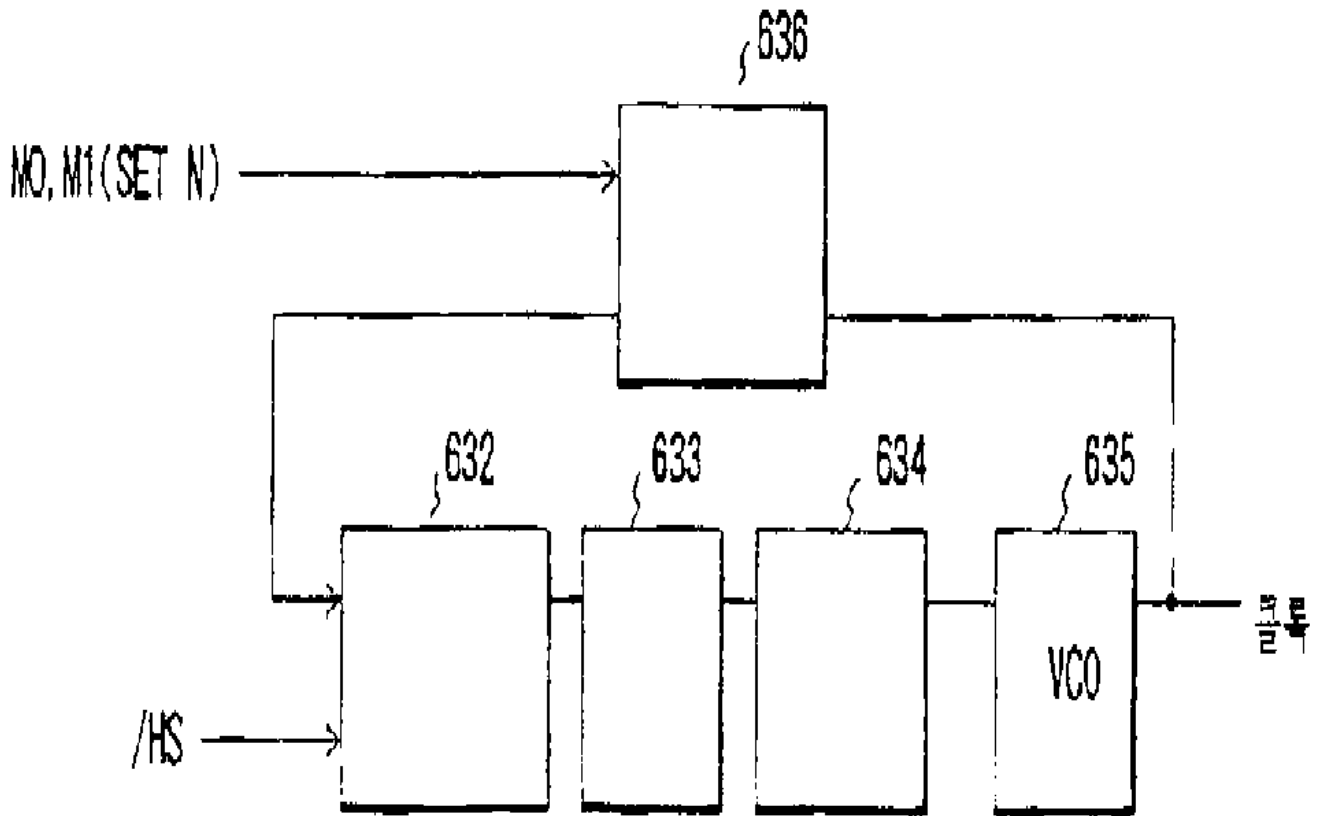


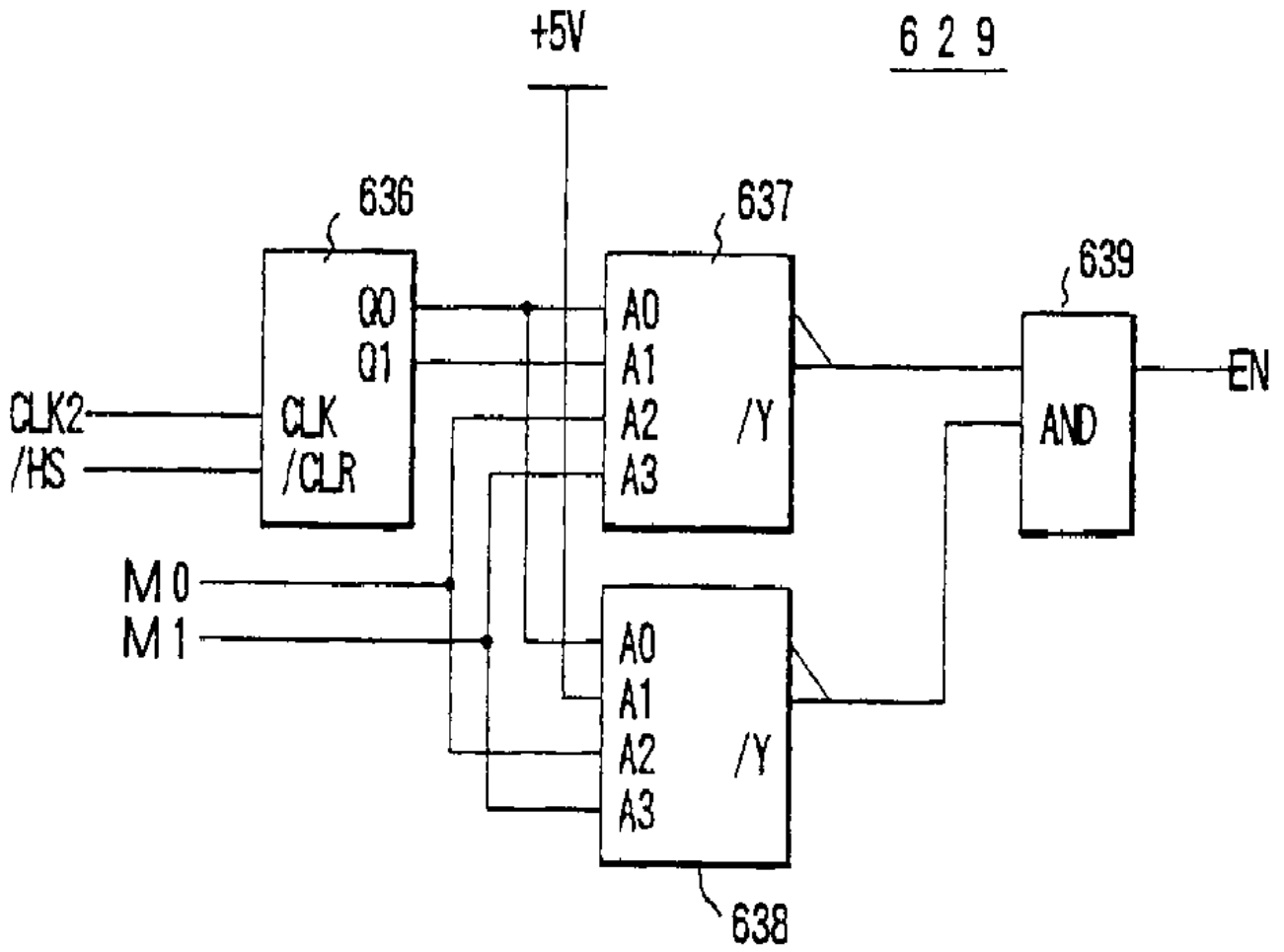


표시모드	동기신호	
	/HS	/VS
640×480	25.42 μ s	16.68ms
800×600	20.80 μ s	13.85ms
1024×768	17.17 μ s	14.27ms

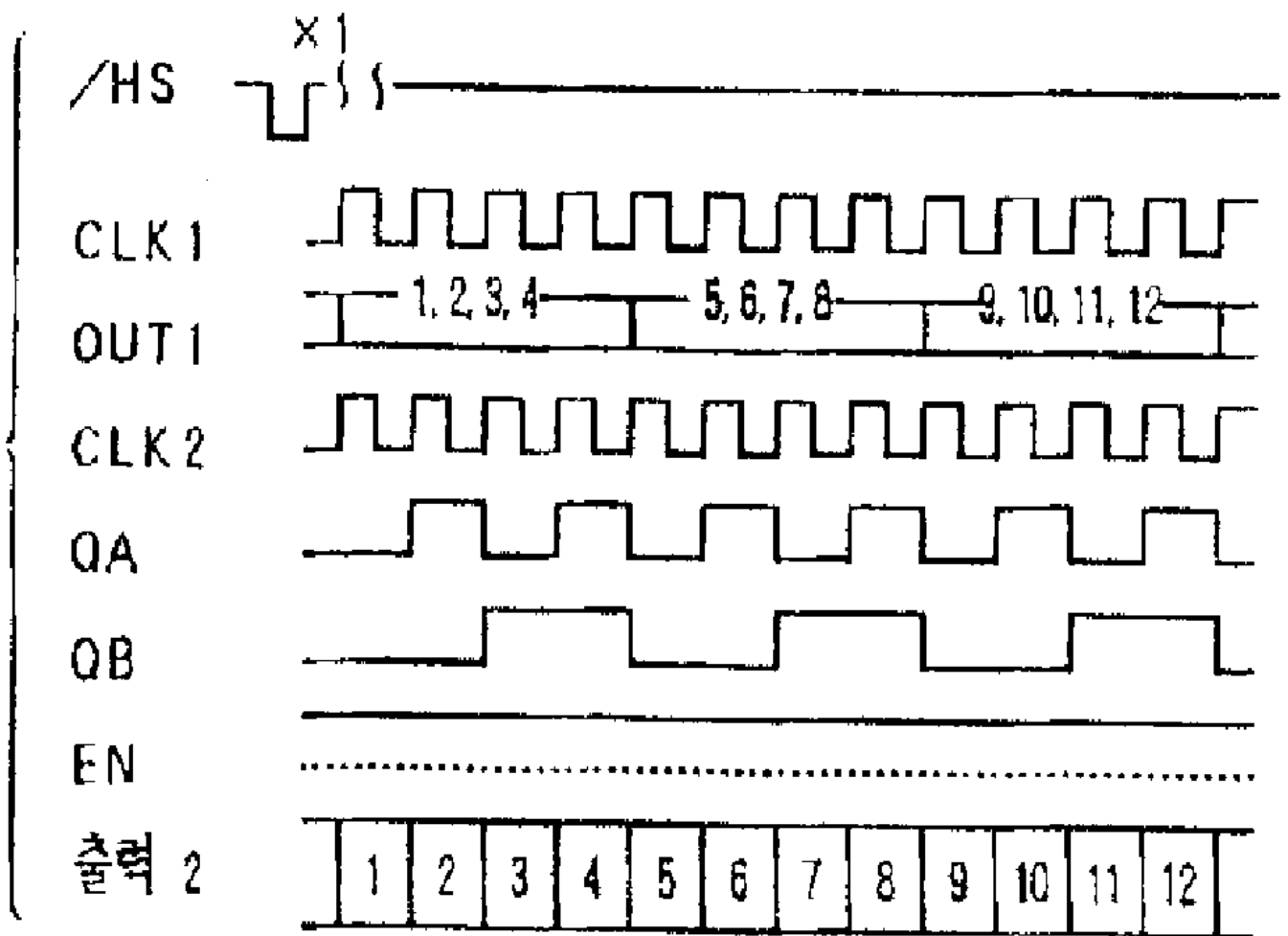
47

627 (628)

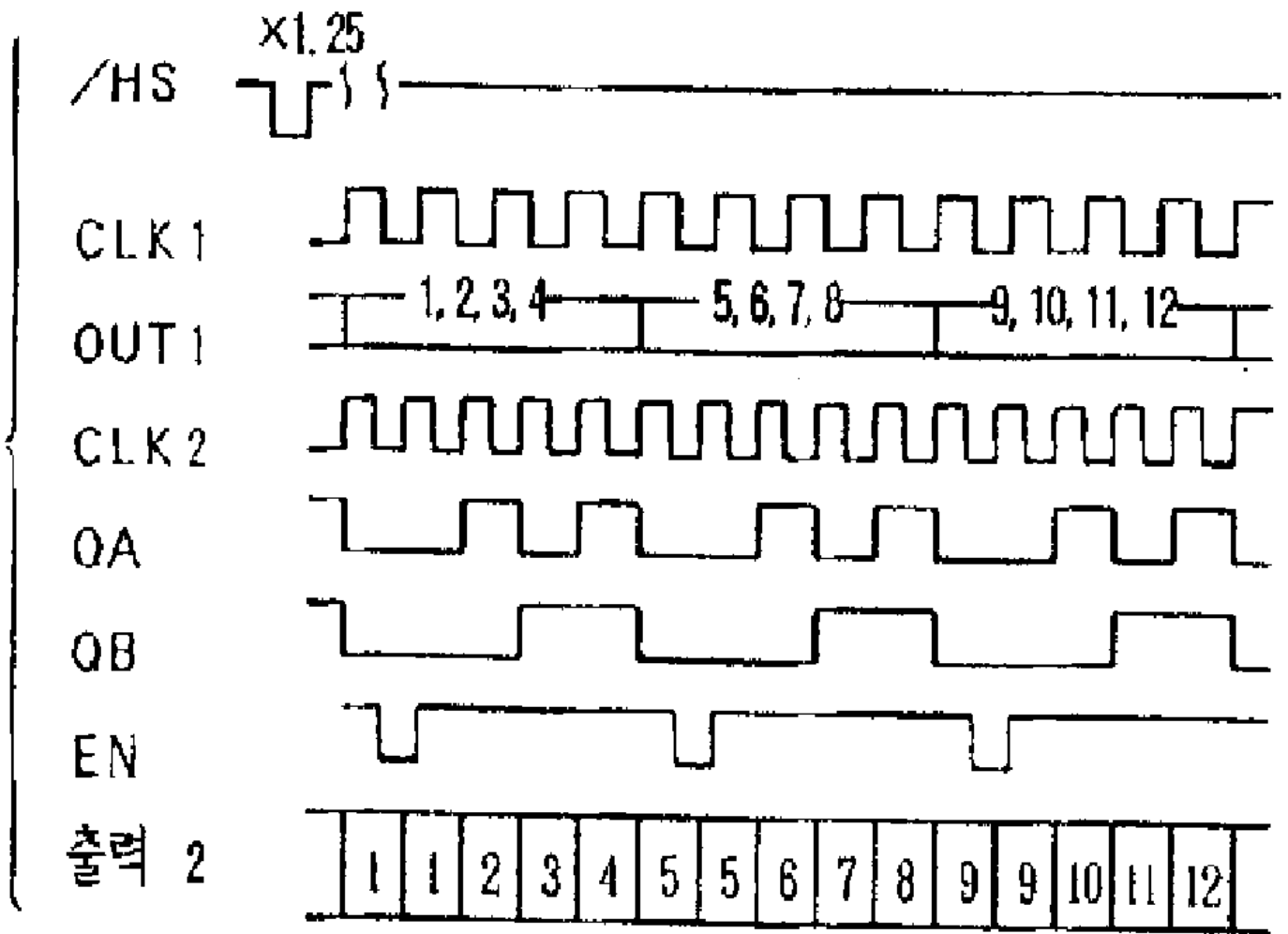




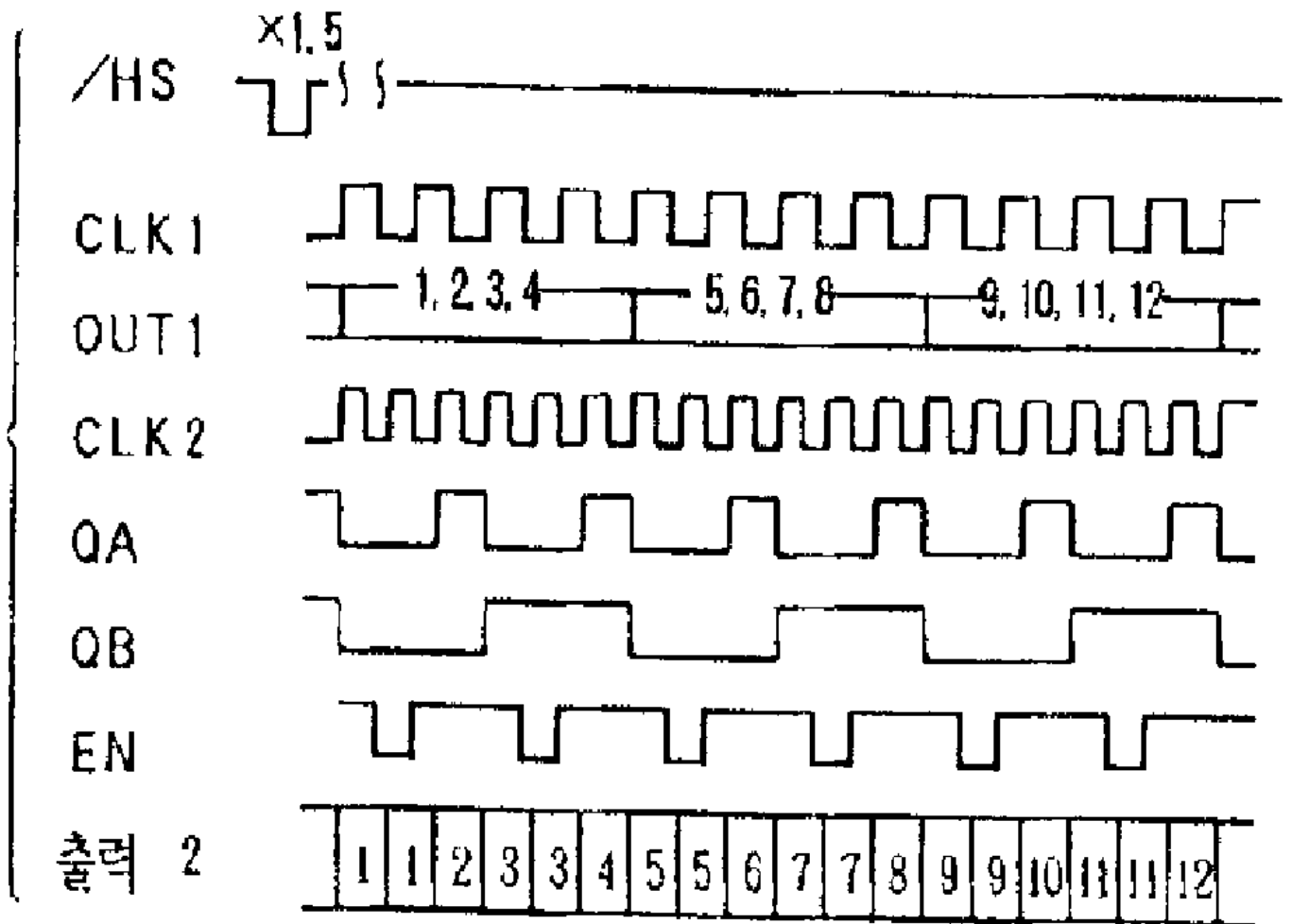
49a



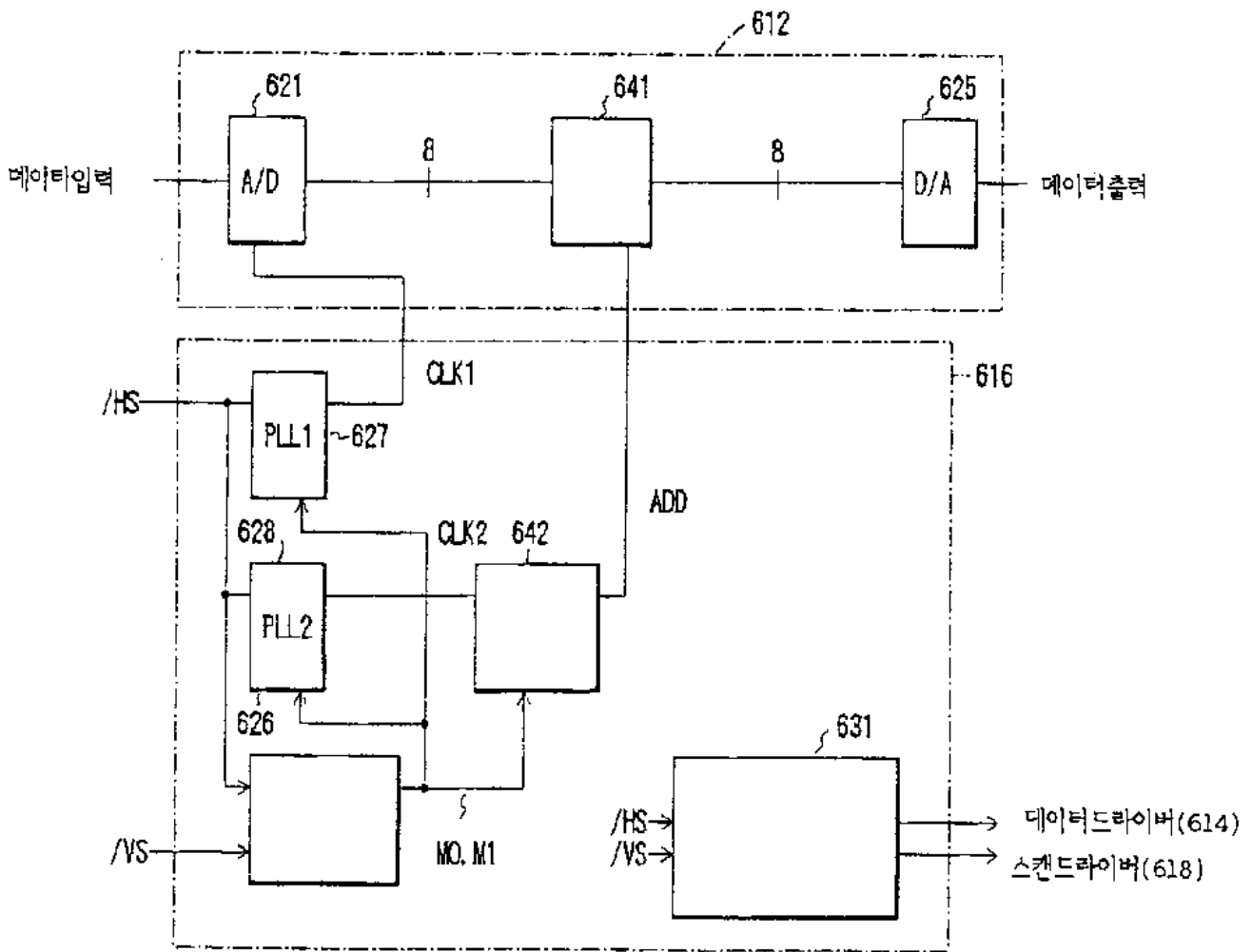
49b



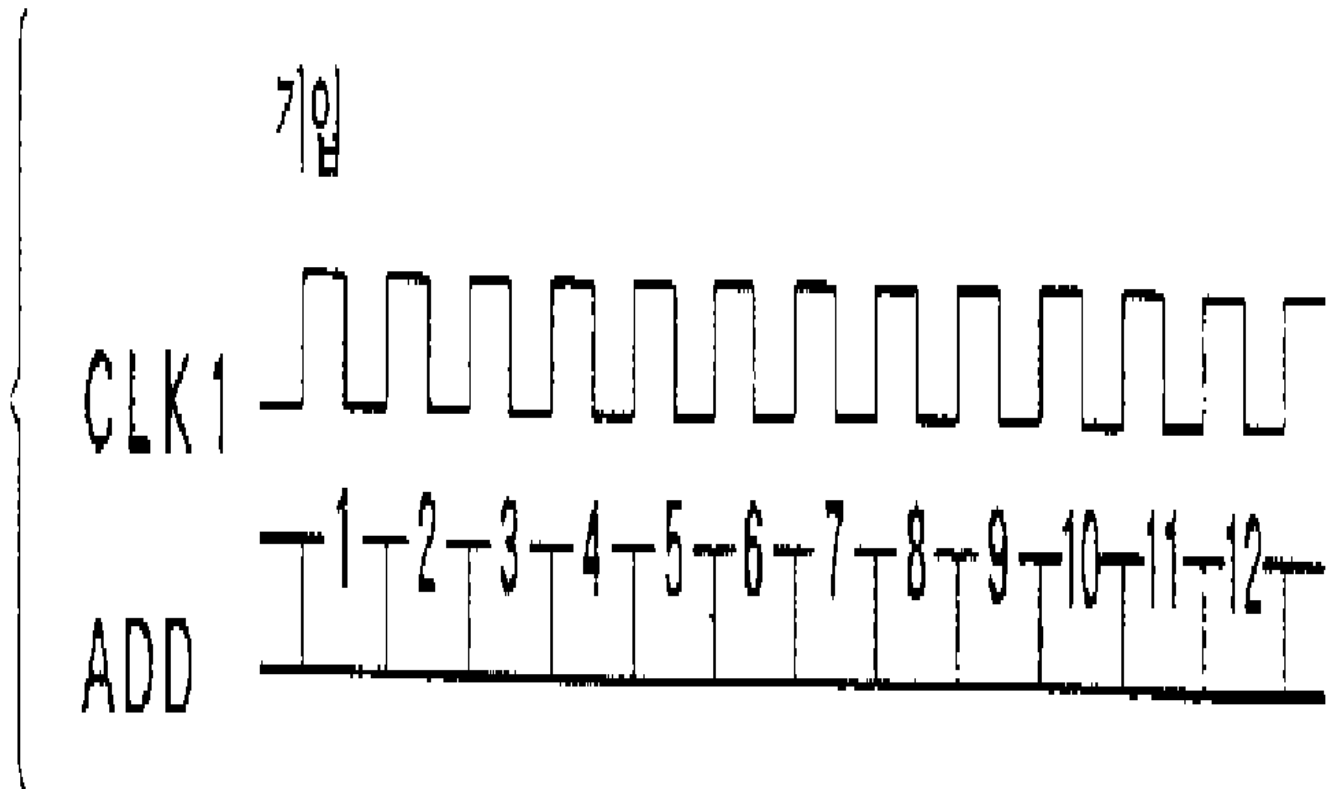
49c



50



51a



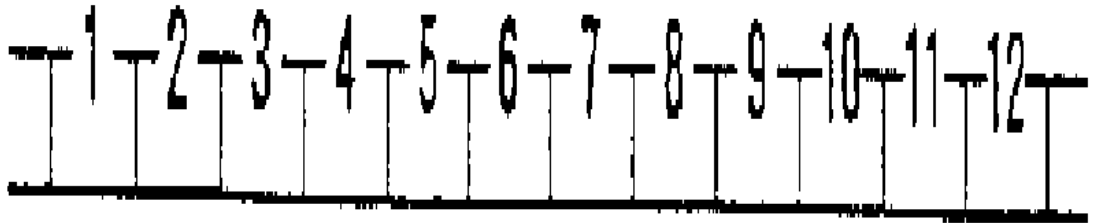
51b

판독 (X1)

CLK 2

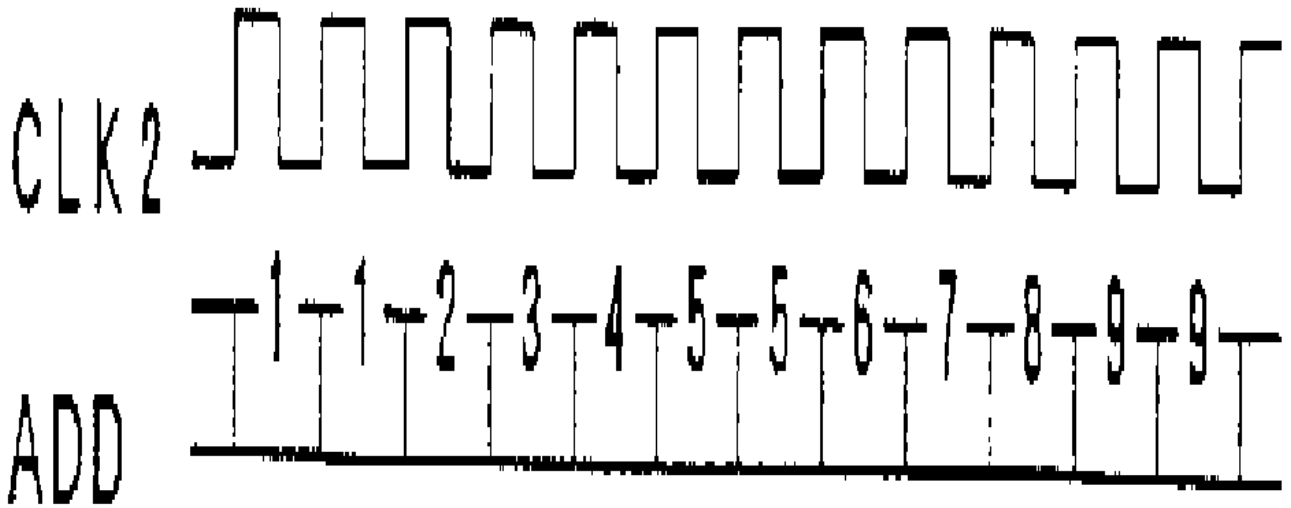


ADD



51c

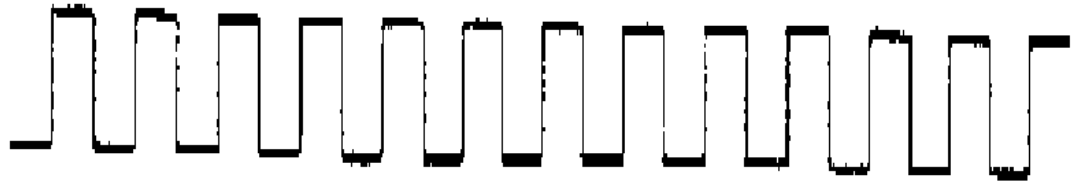
판독 (X1,25)



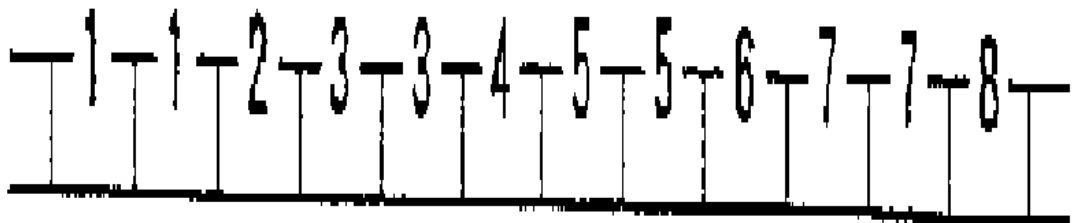
51d

판독 (X1.5)

CLK 2



ADD



642

