

(19) (KR)  
 (12) (B1)

(51) 。 Int. Cl. <sup>6</sup>  
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 (11) 10 - 0306062  
 (24) 2001 08 04

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(21) 10 - 1994 - 0012317 (65) 1995 - 0002291  
 (22) 1994 06 01 (43) 1995 01 04

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(30) 157944/1993 1993 06 03 (JP)

(73),  
 94  
 (72) 94,  
 94,  
 94,  
 (74),  
 :

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(54)

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, (1) (4) (2A, 2B), , (2A), (2A, 2B), (1), (2)  
 , (2A, 2B), (1)

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10

11 D

12 2 가

13 2 가

14 AMI .

15 2 가

16 2 가

17

18

19

20

21			(A    B)	1
22			(A    B)	2
23	21	22	(A)	.
24	21	22	(A)	.
25	21	22	(B)	.
26	21	22	(B)	.
27	21	22		.
28				.
29		가		.

\*

1 : (PBX) 11 :

14 :

15 : 16 :

17 : 18 :

19 · 2A ·

2B :

4 : 6 :

가 . , . , . , .  
가 . , . , . , .

[ 1 ]

1 , PBX(1) (15) (15) (13) (14) (13), 64Kbps  
4)가 , (15), (13) (14) (2A, 2B)(3)  
, (LIN)(11) (5) (COT)(18)가 ,

(16) (17), , (15), , (11) . , (18)  
 PBX(1) . , (16) (16) . , (19)  
 (16) (16), (17), (15), (11) (18)

$$, \begin{pmatrix} 2A & 2B \\ & (11) \end{pmatrix} \begin{matrix} 2 \\ 2 \end{matrix} \text{ 가 } (4), \begin{matrix} . \\ . \\ . \end{matrix}, \begin{pmatrix} 2A \\ 2B \end{pmatrix}$$

2 (11) (2A, 2B)  
 (bearer rate) 512Kbps , 64Kbps ( )  
 , B 2 , 16Kbps D 2B+D  
 (B1+B2+D) . , 144Kbps , 125μs,  
 AMI ,

3 (11) (2A, 2B)  
 4 . 3 4 , 「00」  
 (2 ) (501) , B1 (8 ) (502) , B2 (8 ) (503) ,  
 「0」 MF ((504) , D (2 ) (505) (1 ) )

5 1 (11) (11) (206) (206)  
 (207) (207) (210 211) (201 202) (201 202)  
 (216 217) (205) , (201 202)  
 (205) (204) (215) , (203)

(207) PBX(1) (16) (214)  
 (210) , (206) , , D 16Kpbs D  
 (211) , , D (206) 16Kpbs (16)

(206) 512Kpbs 2  
 144Kpbs(2B+2D) , PBX(1) (14) (212)  
 (B1, B2 ) , (207) (210) (D )  
 3 (216) (217) 「1」 가 , (216, 217) 가  
 「0」 , (216) (217) (220) (216)  
 (217) , (213) PBX(1) (13) (B1, B2 )  
 (211) 16Kpbs (207) (D )

(205) (206) (204) (204)  
 , (218) (219) (204) AMI  
 (4)

, (201 202) (4) (-24V)  
 (2A, 2B) (203) (204)  
 (215) , (4) 가

6 (2A, 2B) (2A, 2B) (72)  
 0) (721) , (720) (721) 가 (codec) (719) , (719) (717 7  
 18) (716) (716) (712, 713, 714 715)  
 (711) (711) (709, 710 733) (708) (705) (708),  
 (708) (706 707) (711) (732) (705)  
 (738 739) , (711) (701 702) (704) (701 702)  
 (704) (701 702) (704) (701 702)  
 (703) (C1) (722) DC - DC (723) (724) (729) (7  
 30) , LED (731) (719), (716), (724), (729), (730) LED  
 (731) (711) (725 726) (725 726) (750)

(701, 702) (4) PBX(1) (11),

(719) (717) (721), , PCM, 64Kpbs 8  
 (720) (720) (720) (750) (718)  
 PCM, PCM, 64Kbps 8

(716) (711) B1 (712) (717) (713) (718) (711) (7) (715) (718), , ,  
 11) B1 (712) (717) (711) B2 (714) (717) (711) B2  
 (715) (718), , , (750) (727)

(750) (729), LED (731) (719) (725) (750) (713), (724),  
 (716) (711) B1 (712) (717) (711) B1 (713) (718)  
 (711) B2 (715) (718) (712) (717) (711) B2  
 (714) (717) (750) (750) (711) (730), 16Kpbs  
 2 (726)

(711) 512Kpbs 2 (713) B1 (715)  
 144Kpbs(2B+D) B2 (726), (713) (D) (709)  
 , (709, 710) (709) (710), (709) (7) (705)  
 10) 「1」 가 (708) (706, 707), (703) (70)  
 , (704) AMI (4) (11)  
 1,702)

, (711) (704) (732) (11) AMI  
 8 , B1, B2 D , B1  
 8 (712) 64Kpbs , B2  
 (714) 64Kpbs , D 2  
 (725)

(705) (708) (704) (704) (704)  
 , (738) (739) (704) AMI  
 , (4)

, (703),  
 (4),

, (722) DC - DC (723) (4) +5V DC - DC (723)

, (704) (708) (711) PBX(1) , (705), (11)

, (C1) (704) , (4)

, (11) (2A 2B)

7 (11) (2A 2B) , 7 (2A)

7 , (312) B2 (14) (212) (207) (212) B1  
 (210) 3 (206) B1 , , B2 (D ) D (4)

, (2A 2B) (711) (302) , , B1 (3)

01) B1 (4) (712) (322) (323) , , B2 (725)  
 B2 (714) (324) , , D

, (2A 2B) (711) (713) B1 (325), (327)  
 (715) B2 (326), (726) D (4)

, (11) (206) (310) (310) (4)  
 (311) , , B1 , B2 (13)  
 (213) B1 (316) B2 (317) , (207)

, (11) (301, 308) (303)  
 , (2A 2B) (302, 309)  
 , (305, 310) (322) , , (306, 311)

, (2A 2B) (302, 309) , , (304)  
 (305, 310) , , FSYNC (11)  
 (2A 2B)

.

	(2A)	(2B)	(4)		
8	(2A) 2B	6	(2B)		8
	(2A)		「A」	,	「B」
	.	8	(2A) 2B		

8	,	(4)	(41)	(2A)	(701A)	(2B)
	(701B)가		,	(4)	(42)	(2A)
	(702A)		(702B)가			

,	(2A)	,	(724A)	,	(750A)	「1」
	(2A) B1		(712A)	(719)	(716A)	,
(711A) B1		(713A)	(719A)	(717A)	,	
(711A) B1		,	B2	(718A)		
.	(716A)			(716A)	「1」	

,	(2B)	,	(724B)	,	(750B)	「
0	(2B) B2		(714B)	(719B)	(716B)	
,	(711B) B2		(715B)	(719B)	(717B)	
,	(711B) B2		,		(718)	
B)	.	,	B1	(713B)	「1」	

9	(4)	(2A 2B)				
PBX	(11)가	(2A)	D			
	(2A)가 D					
	(11)	(B01)가	,	가	9	, PBX
	.	(B01) B1		(2A)	(4)	(B02)
	,	B2		.	D	
	(B02)	,	7			(2A 2B)

,	8	,	(2A)	(711A)	(732A)	(B02)
	,	B1	B1	(712A)	,	D
	(750A)	.	(750A)	(2A)		
.	B2		(714A)	(716A)	,	,
(2B)		(711B)	(732B)	(B02)	B2	
B2		(714B)	,	(750B)		
(750B)		(2A)	D			
(712B)	,	(716B)	.	,	B1	

, (2A) B1 (713A) 「1」 (B03) 「1」  
 B2 (715A) 「1」 (2B) B2 (715B) ,  
 「1」 B1 (713B) 「1」 (B03) (B04)  
 「1」 (4) (4) (B05) 「1」 (B05) 「1」 (B04) 가  
 (가 ) (11) 7 PBX (11)

, (11) (206) (B05) (4) (213) ,  
 (B05) B1 B2 (317) (318) (207) (13) D (11)  
 (316) B2 (211)

, 125μs (4) (2A 2B)  
 .

, D 9 , , PBX(1) (11)  
 (2A) D (2A) , PBX(1) (11)  
 (B01, B06, B11, B16) D (2A) 1 , 76 1  
 52 1 ( ) , , , , , (2A)  
 1 9.5mS

, (2A) 1 , , PBX(1) D  
 . , (2A) (B18, B23) D PBX(1) 16 , P  
 BX(1) 32 1 ( ) , , , 2mS  
 PBX(1) (11) 「1」 (11) (2A) (2B) (B01) D 64mS  
 , PBX(1) (11) 가 (11) (2A) (2B) (B01) D

10 PBX(1) (11) (2B) D 1  
 0 , , PBX(1) (11) (2B) (2B) (B31, B36, B41, B46) D  
 (2B) 77 , , (2B) 1 (2A)

, (2B) 1 , , PBX(1) D PBX(1) 16 , PB  
 . , (2A) (2A) , , , 2mS  
 X(1) 1

, PBX(1) (11) (2B) D  
 , (11)가 (2B) (B31) 64mS , ,  
 PBX(1) (11) (2A) D , , 11  
 128mS 가 .

, (2A)가 . 12 13 (2B)가 (2A)가 가 (4) (2B)가  
 가 (4) , 13 , 13 (2B)가 D (2A)가 D

12 , (a) (2A)가 , , (1201)  
 가 B1 (1202) 「1」 B2 (1203) , MF (1204)  
 가 D (1205) , (1206) . (1207)  
 AMI (4)

, (b) (2B) 가 , (1211) 「 1 」  
 B1 (1212) 가 , B2 (1213) MF (1214) , 「 1 」  
 D (1215) (1216) . (1217)  
 AMI (4) .

, (4) AMI (1207) AMI (1217) 가 가 ( )  
 가 ), (c) AMI (1227) 가 . ,  
 (4) (1221) , (2A) 가 B1 (1222)  
 (2B) 가 B2 (1223) , MF (1224) (2A)  
 가 D (1225) , (1226) , 3

, 13 , (2B)가  
D 가 「1」 (2A 2B) . .

,AMI 14 AMI 2 「0」  
,2 「1」 ( ) ,2 「0」  
,14 가 「010011001」,  
, , , , , , , ,  
(2A) (2B)가 (4)

가

, (f)

PBX(1)

AM

16 PBX(1) AMI 16 , (a)  
 (2A)가 , 가 「00010111011111111001P」 ,  
 (b) (a) AMI . (c) (a) , (b)  
 (1607) (1608) . , (d) (2B)가  
 , 가 「0011111110101100011P」 , (e) (d)  
 MI . (f) (d) , (e) (1617) (1618) A

, (2A 2B) (c) (f) , (g)  
 가 , (h) PBX(1) AMI

AMI

17 6 가 (708) ( 8 (708A, 7  
 08B ) , 18 (708)

, (708) (708) (2A 2B)가 (708)  
 8 , (708B) (4)  
 (2B) (724A) B1 , (2B) (724B) B2 (2A)

(708)

(711) (709, 710) AMI (706, 707)  
 , AMI , AMI , , (705)  
 (704) AMI , , (703) (701, 702)  
 (2B) (11)

, 8 , (11) (732B)  
 (701B, 702B) 가 (703B) (704B) , ,  
 (711B) (703B) (704B) , , D ( (705)  
 (708B) (902) (711B) 「0」 (826)  
 DFF(805) (822), DFF(806) (823), DFF(808) (825) DFF(809) (826)  
 (905, 906, 910 911) 「0」 , 「0」 , 「0」 「1」 (2A)  
 , (11) (2A 2B) 가 , (2A)

(2B)

, (801) (803) (732) 2.5V (732) AMI  
 , (804) (732) 2.5V (732) AMI  
 .  
 (732) 가 (801) (4) 가 ), , (732) 가 (912)  
 2.5V (802) (821) (904) (820) (903) 「0」 「0」 , ,  
 (802) (824) DFF(805, 806)  
 「0」 (ExOR) (807) (803) (807) (824) (907)  
 DFF(808, 809)

, (711B) (709) 1 (924) 가 , D  
 FF(808) , (824) 「0」 , DFF(808) , (825)  
 (910) 「0」 , (924) 가 NAND , (811)  
 , NAND (811) (828) 「0」 (931) , NAND (814)  
 . , NAND (814) 「0」 NAND (813) (830)  
 (909) (710) 「1」 가 「1」 , , NAN  
 D (814) (706) (933) 「1」 , , NAND (815) (707)  
 (810, 812 813) (827, 829 830) 「1」 「0」 , , (705)  
 「0」 (706) 「1」 , (707) 「0」 , ,  
 (704) 가 , (4) (937) 가  
 .

, (2A) , (4) (937) (2A 2B)  
 가 가  
 .  
 , (937) (704) (732) , (801) (820) (918)  
 913) , DFF(805) , DFF(805) , (822) DFF(805)  
 「1」 , , (4) (919) 가 「1」 , ,  
 ExOR (807) (824) 가 .  
 (4)

, (711B) (710) 2 (927) 가 , DFF(809)  
 , (826) 「1」 , NAND (812) (829) (93  
 2) 가 , , (815) (707) (935) 가 , (706) 「  
 0」 , (707) 「1」 , (705) (704) 가  
 , (4) (938) (938) (2A 2B) 가 ,  
 , (2A) .  
 .

, B1  
 , (4) (2A) (939, 940, 941)  
 , (801 802) (820 821) (914, 916, 915)  
 , (939, 940, 941) (2A) B1 가 「11010101」, 3,  
 5, 7 가 「0」

ExOR (807) (824) (939, 940, 941) (920) 「1」,  
          (921) 「0」, (922) 「1」,  
          (824) (4) DFF(805, 806),  
          (922) 「1」, DFF(805, 806) (4)

, (2B) B2 (4)  
 (2B) 가 . B2 . 가 「11011010」,  
 B2 3, 6, 8 가 「0」, 3, 8 (709)  
 (925, 926) , 6 , (710) (928)  
 (927) (710) , (925) (709)

, , ExOR (807) (824) (922) 「1」  
 (709) (925) , DFF(808) , DFF(808) (825) (929)  
 「1」 , 가 . , NAND  
 (810, 811, 812, 813, 814, 815) , NAND (815) (707) (936)  
 , (706) 「0」 , (707) 「1」 , (705)  
 (704) 가 (4) (942) 가

, (4) (942) (802) (821) (917), ExOR (4)  
 807) (824) (923) 「0」 ExOR (807) (824)  
 (923) 「0」 (710) (928) 「0」 , DFF(809)  
 , DFF(809) (826) (930) 「0」 .  
 (710) (928) NAND (814) (934) . , (706)  
 「1」 , (707) 「0」 , (705) (704)  
 가 , (4) (943) 가 .

, (2A 2B)가 (4) (2A 2B)  
 , (708) DFF(805, 806), DFF(808, 8  
 09), ExOR (807) NAND (810, 811, 812, 813, 814, 815). . ,  
 (2A 2B) 가 , B1

, B2 D , , MF  
 가 (4) , AMI (4) AMI

, (2A 2B) (11) (2A) (4) , PBX1  
 (11) (2B) B2 (2A) B1 (11)

, PBX(1) (11) (2A 2B) (4) 7  
 2B) PBX(1) (306) 가 (301) (2A)

, 8 (2B) (711B) 가 (4) (2A) 가 (2A 2B) (306) 가 , PBX(1)  
 (301) (301) 가 (2B) 가 (2B) 가 (2A) 가  
 가 (306) D

, (2A 2B) (750A 750B) , D D  
 (711A, 711B) ,

, 1 8 , ,

19 PBX(1) 가 D (2A 2B) (2A 2B) 19  
 , (1900) (1901) (1903) 가  
 (1902) , (1905) LED LED  
 , LCD (1907) , (1908) BCC (1906) B  
 CC (1909) . , (1900) 152 (= 8byte x 19)

20 (2A 2B) 가 D PBX(1) 20  
 , (2000) (2004) BCC BCC (2003) (2001) ,  
 (2002) BCC (2000) (2000)

32 (= 8 byte x 4)

21 27 PBX(1) (11) (2A 2B) (2A 2B) ,

, (2A 2B) (11) (S01), (2A 2B) 가 (4) ,  
 (724A) , B1 (S02, S03). (2A) 8 , (716A)  
 (S04). , (2B) (724B) , B2 (716B)

, (11) (2A) (1900) (4) (S06),  
 (16) (S13).  
  
 , (2A) (1900) (S07), (1900) (1902)  
 (2A) (2A) (11) (2000) (S11), (S09). ,  
 (2000) (2B) ) (S15), (1900) (11) (190 .  
  
 , (2B) (11) 가 (2A) (1900) (1902) (2A) (1900)  
 (S08), (1900) (1900) (S12). , (2B) (S18).  
  
 (11) (2A) (2000) (S14), (2000)  
 (S16), (16) (1900) (16) (4) (S19), (16)  
 (2B) (2B) (S23).  
  
 (2B) (1900) (S20), (1900) (1900) (1902)  
 (2B) (11) (2000) (S22), (S21). , (2B)  
 (2000) (2A) ) (S25), (1900) (11) (1)  
 900) (S29).  
  
 , (2A) S15 가 , (11) 가 S19 (20  
 00) . , (2A) S15 , (2A) S15 , 100mS ,  
 (S27), (S28).  
  
 , (11) (2B) (2000) (S24), (2000)  
 (S26), , (2A) (1900) (16) (4) (S30), (1  
 6) (S34).  
  
 (2A) (2A) (1900) (S31), (1900) (1902)  
 (11) (2000) , (S33), (S32). , (2A)  
 (2000) (S36), (11) (1900)  
 (S38).



(57)

1

,  
가  
,

2.

1 , 1  
,  
1 , 1 , 가  
,

3.

1 , 2 AMI ,  
,

4.

1 , 1  
가 ,

5.

, 2 - , 2 -  
2 -  
,

1 ; ; 1 2  
가 ; ; ,  
1 ; ; ,  
2 - 2 - 2  
2 - 1 2 ,  
1 , 1 ,  
1 , 1 ,

, 1 가

1 가

2 가  
1 ,

6.

5 , 1

1 , 1 , 1 ,

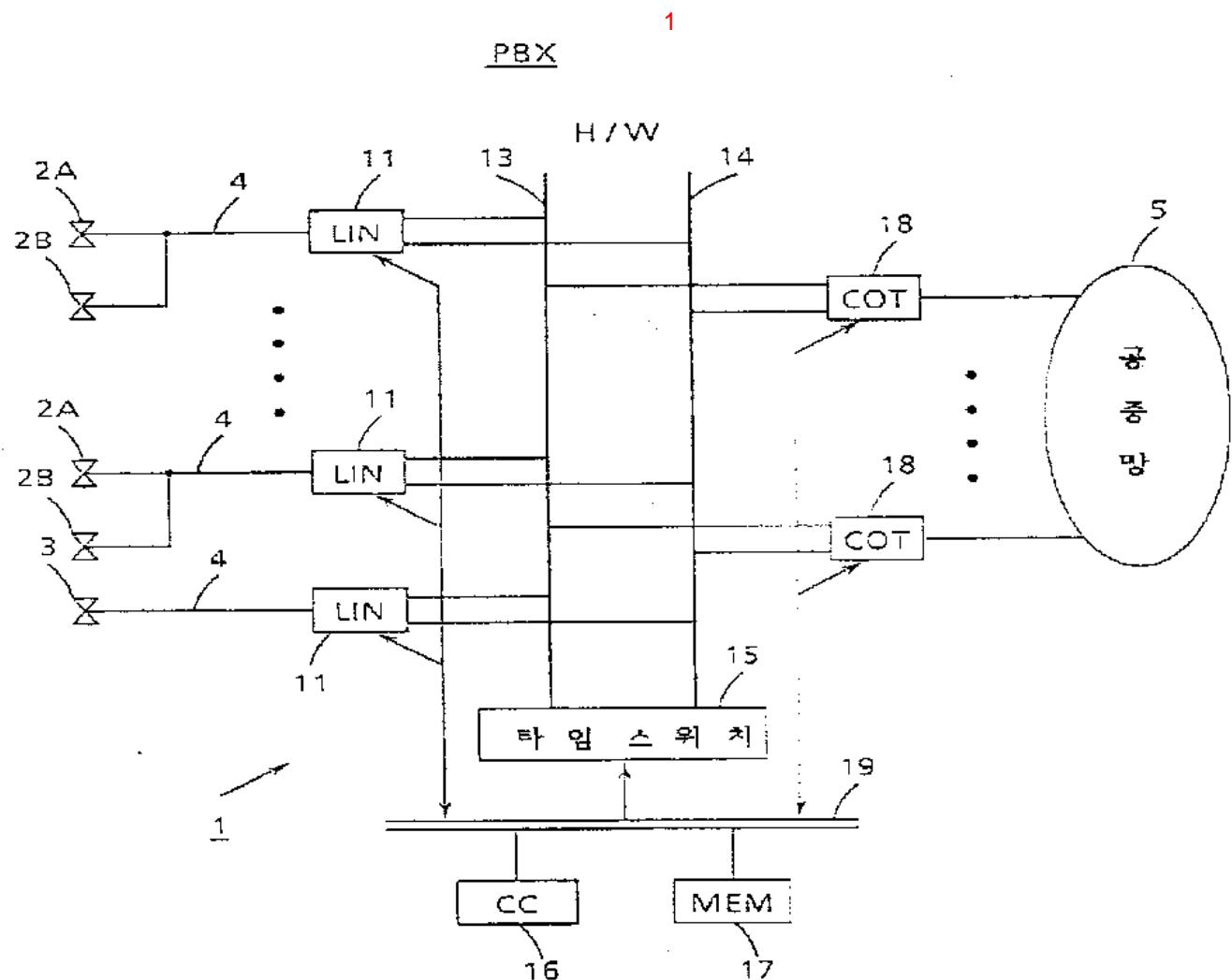
7.

6 , 2 AMI ,

,

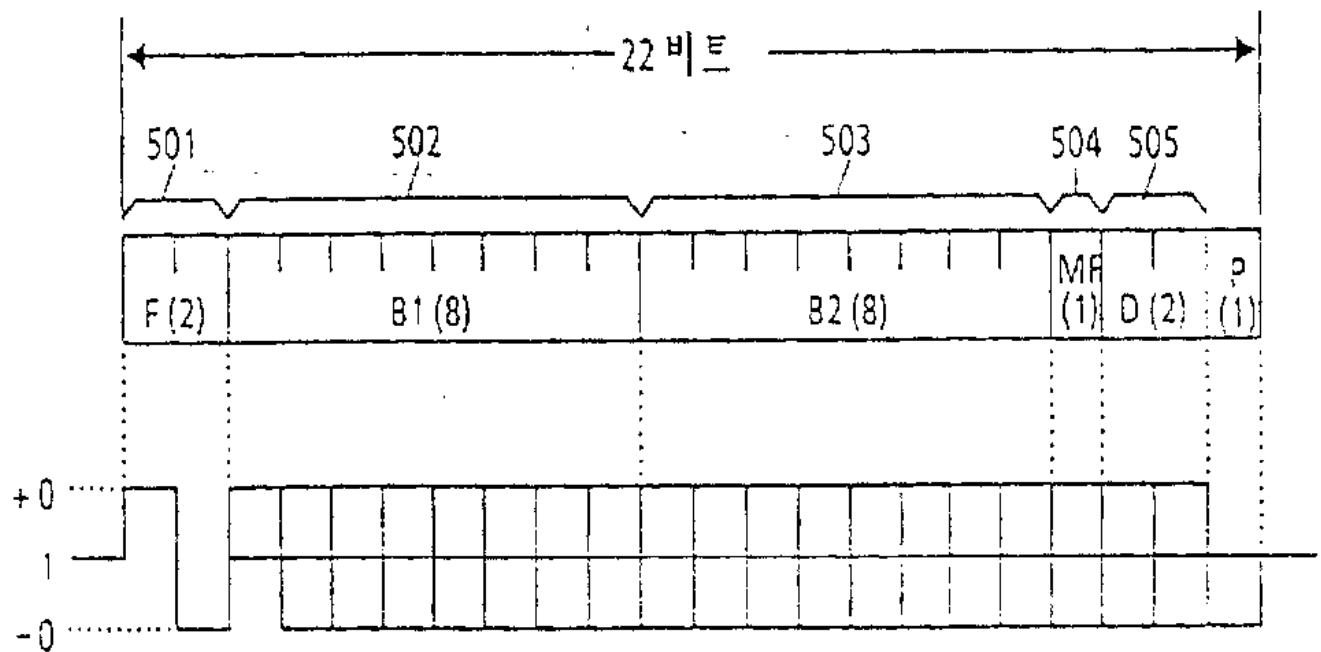
8.

6 , 1  
가 ,



항 목	내 용	
전송 베어러속도	512 Kbps	
전 송 용 량	음성데이터채널 제어정보	64Kbps x 2채널 16Kbps
버스트동기	125	
전송부호	AMI부호	
동기방식	스타트비트에 의한 조보동기	

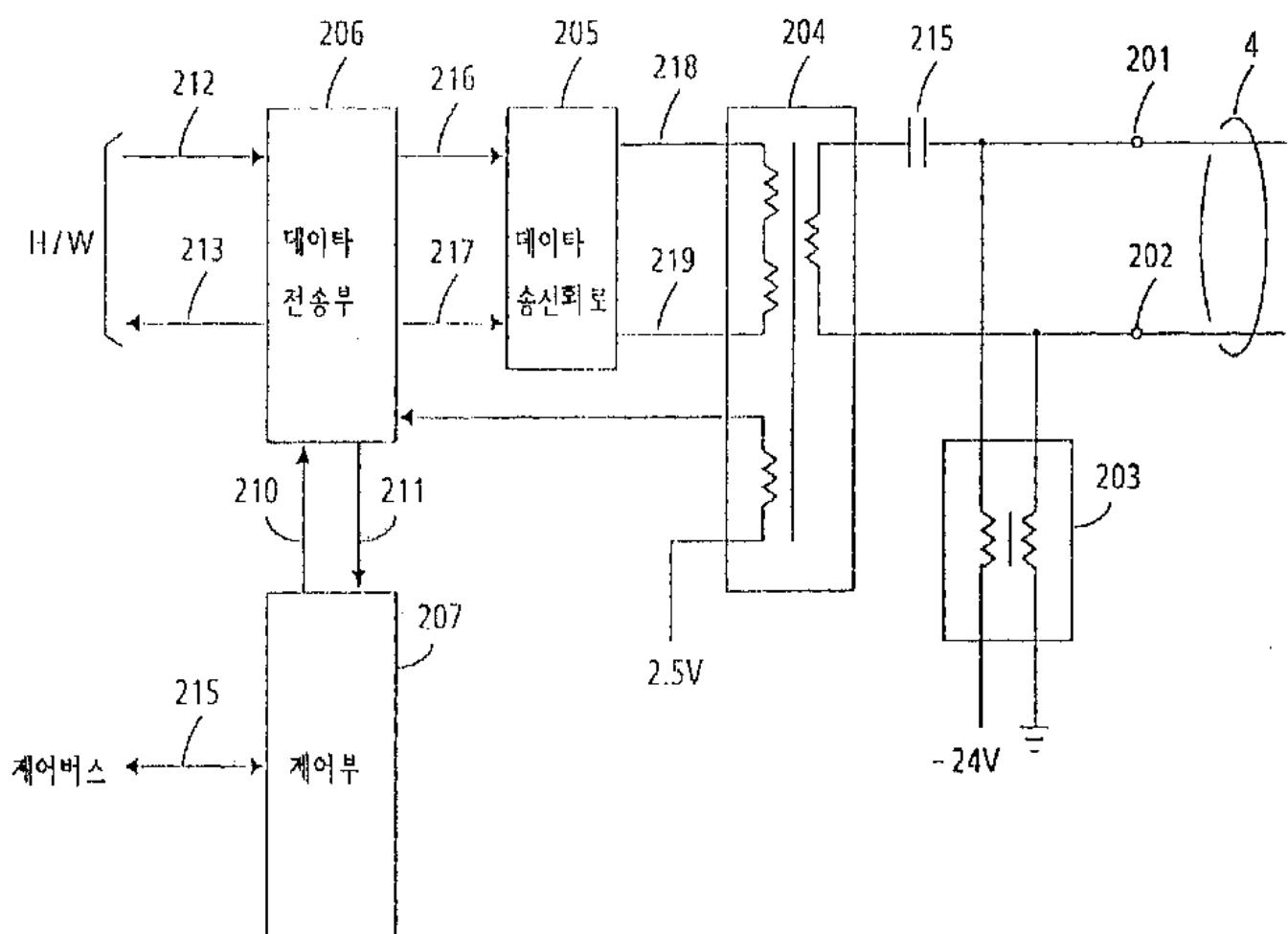
3

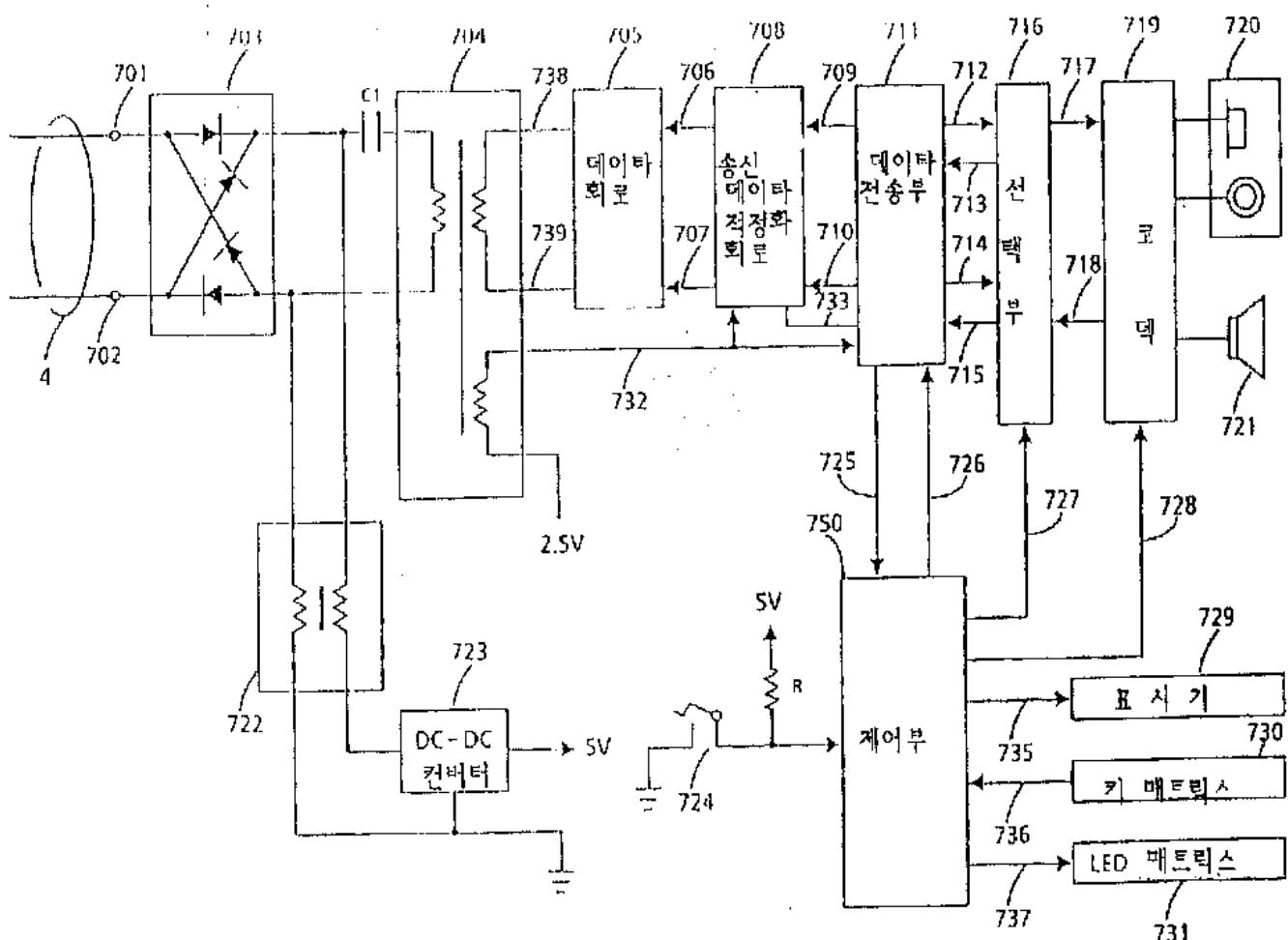


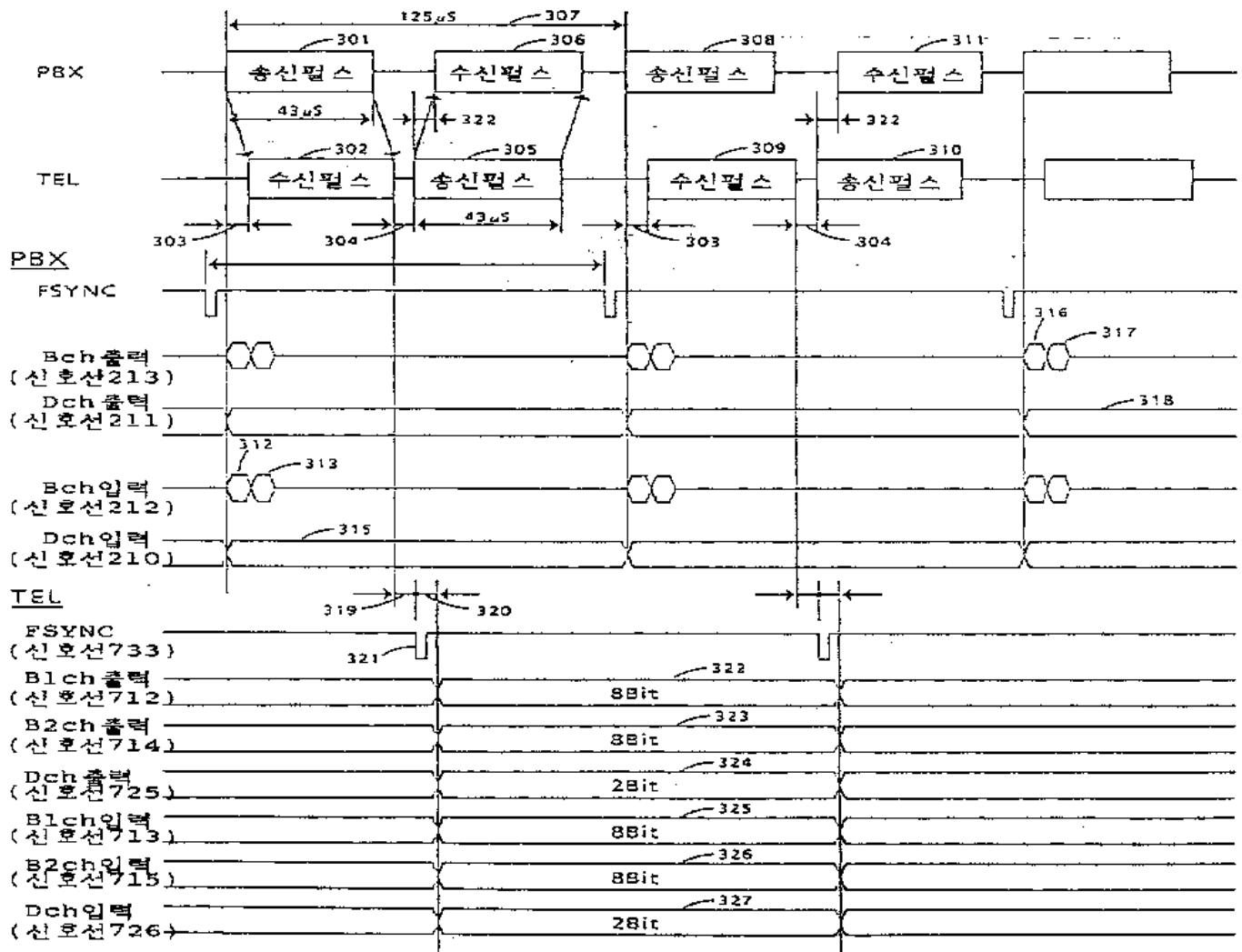
AMI 부호화

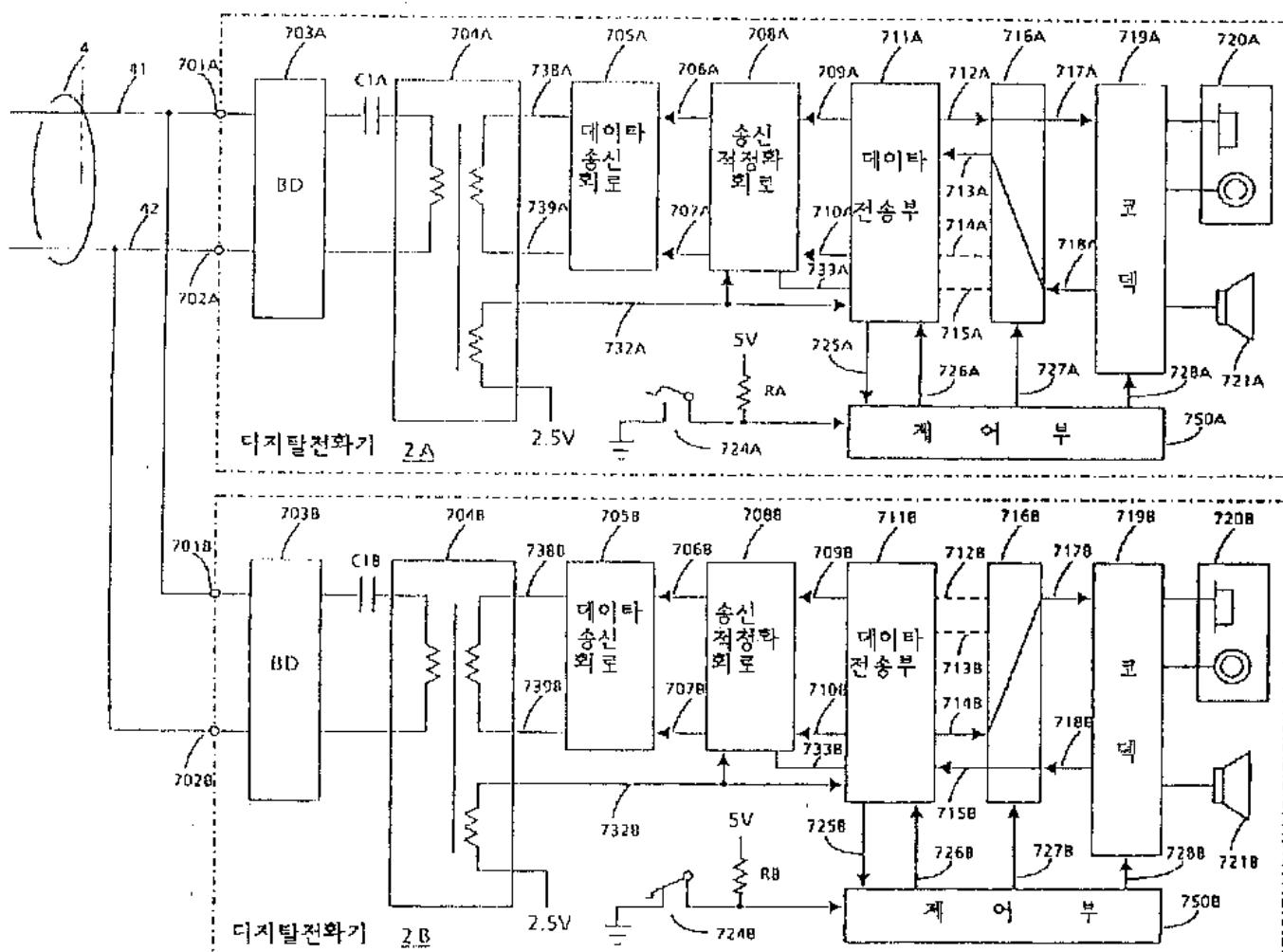
예(수신파형)

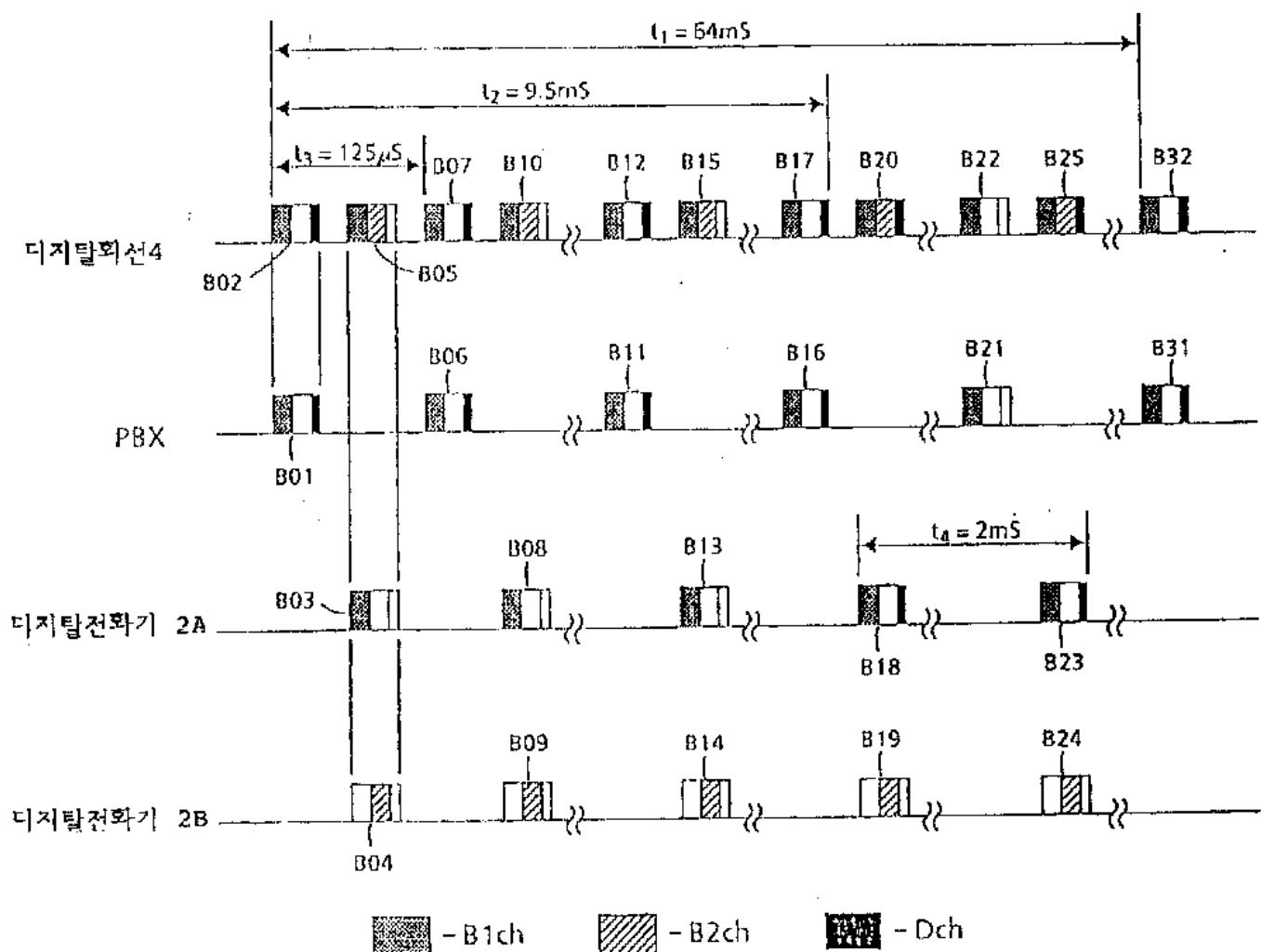
부 호	내 용	비 고
F	스타트비트(프레임도이)	상시'00'
81	81 채널 (64Kbps)	)
82	82 채널 (64Kbps)	무통화시 all '1'
MF	MF비트	상시 '0'
D	D 채널데이터 (16Kbps)	
P	패리티 ( 우수 )	직류성분제거



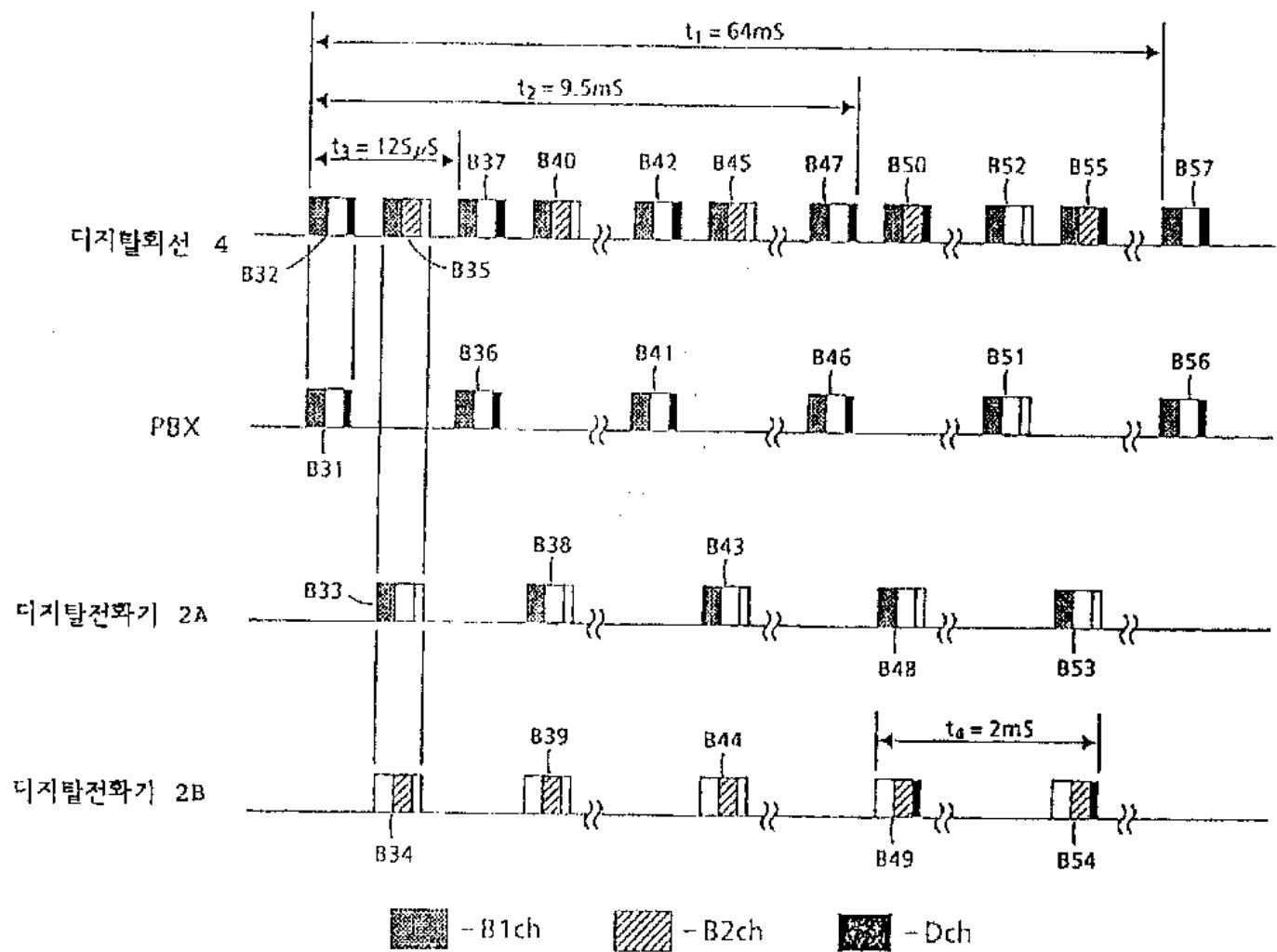




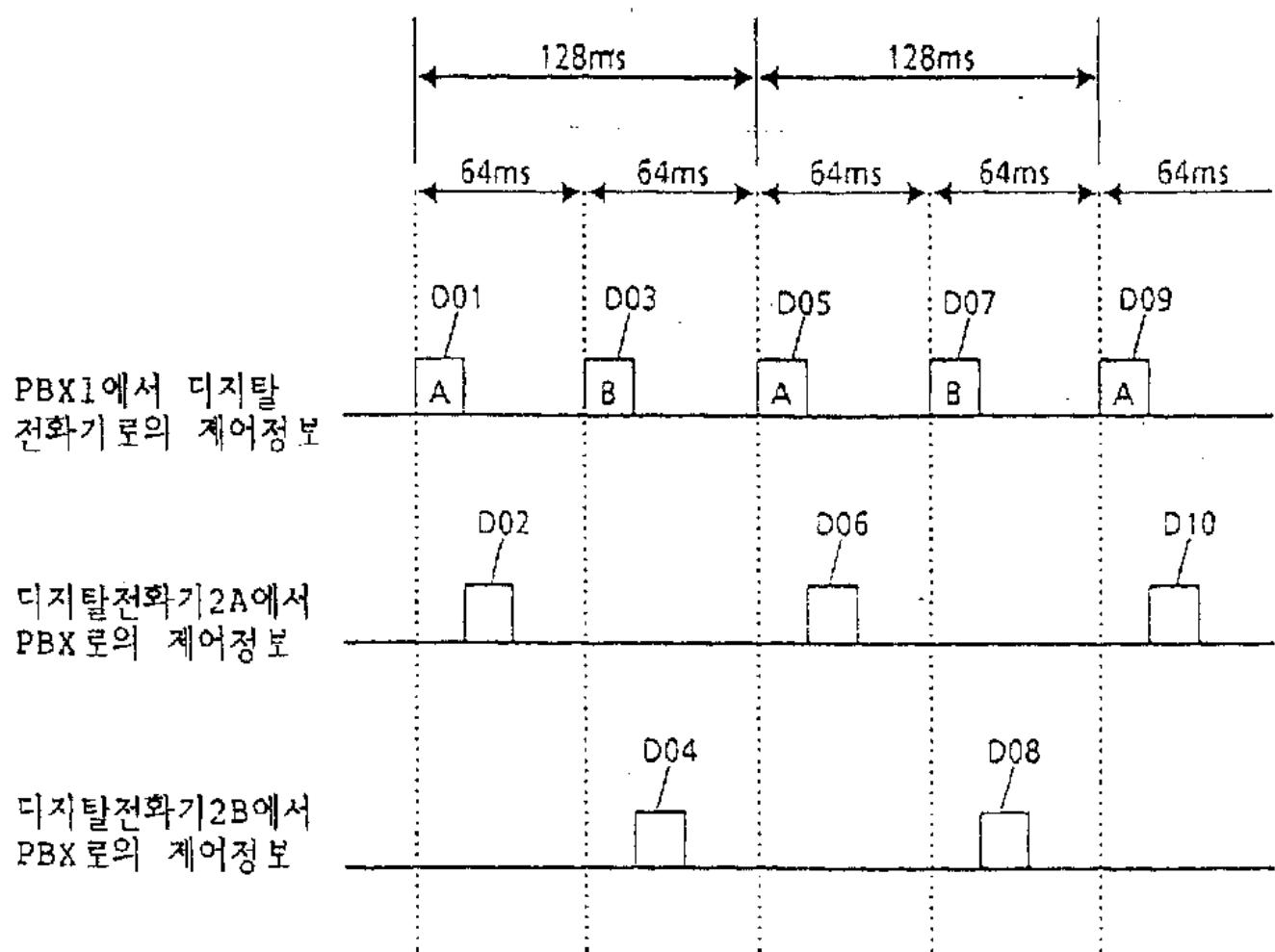




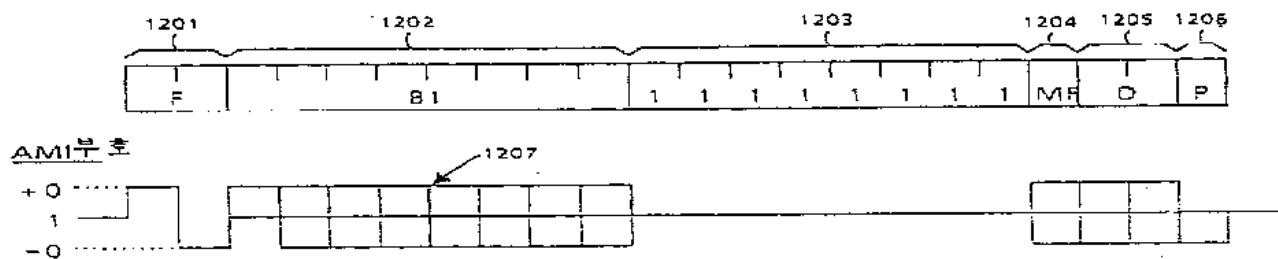
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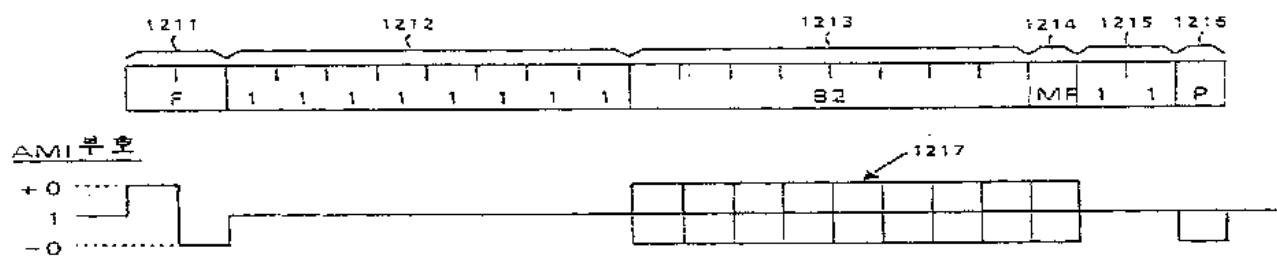
11



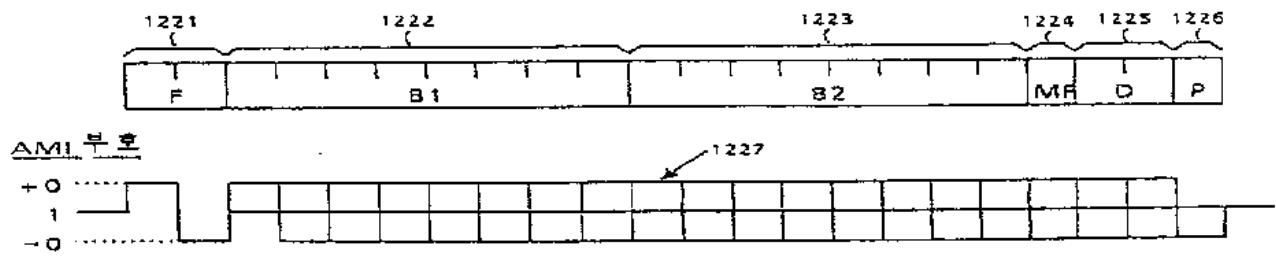
(a) 디지털전화기 2A의 송신 버스트신호



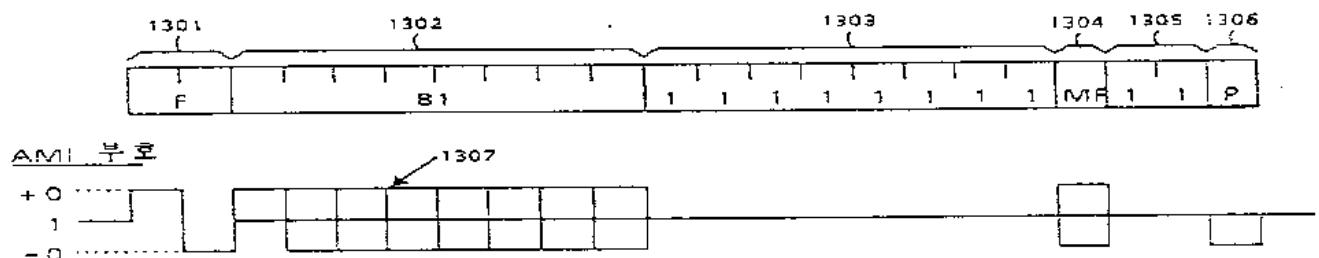
(b) 디지털전화기 23의 송신 버스트신호



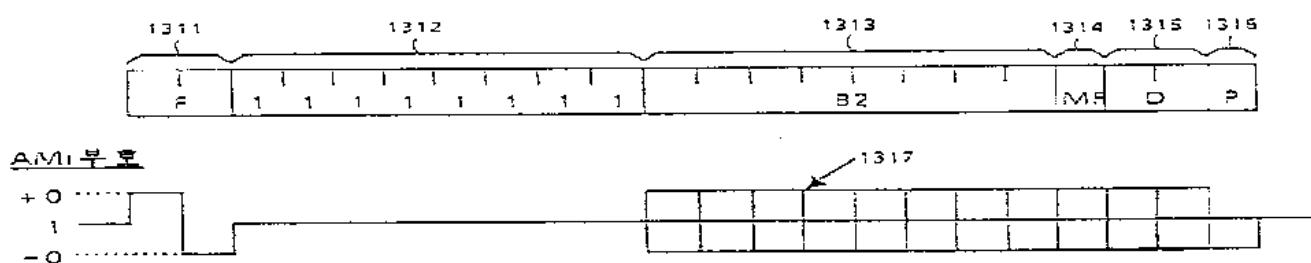
(c) 디지탈회선4상의 버스트신호



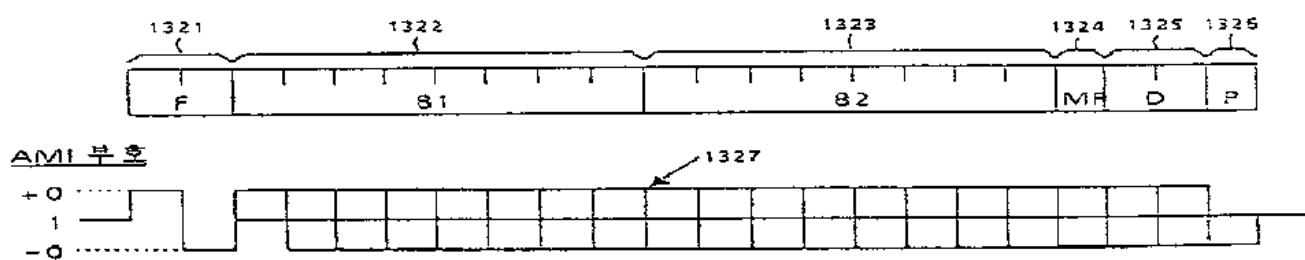
(a) 디지털전화기 2A의 송신 버스트신호



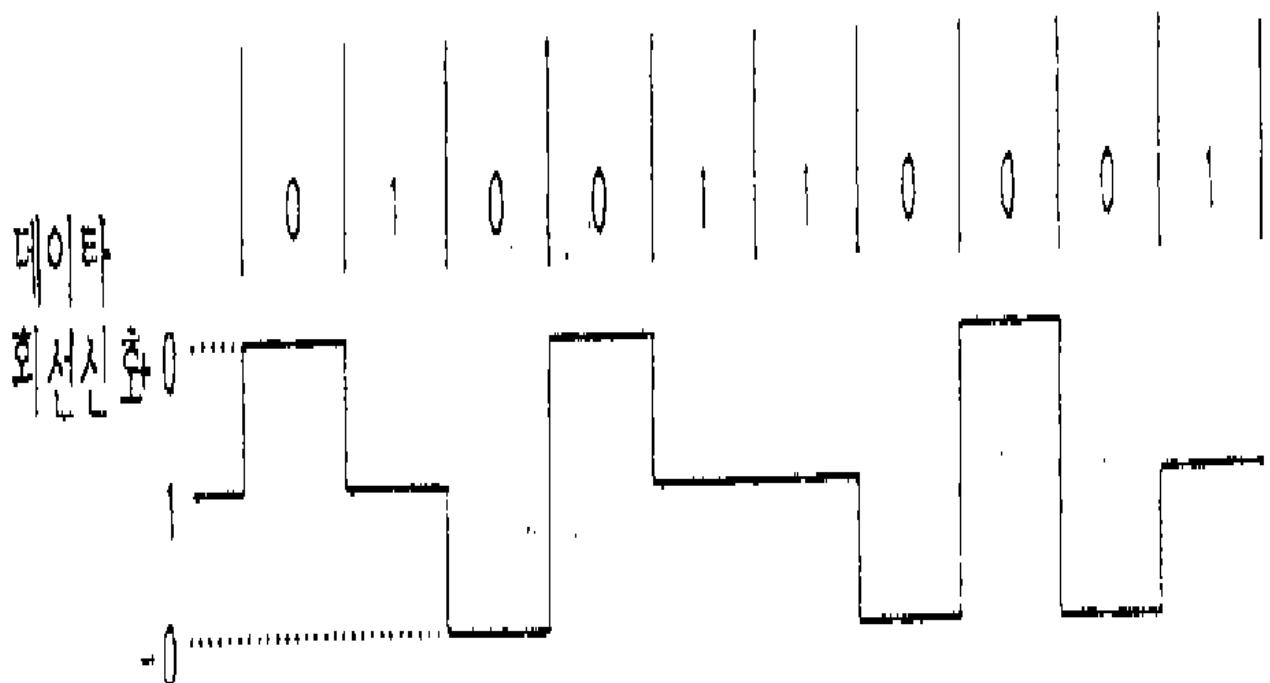
(b) 디지털전화기 2B의 송신 버스트신호



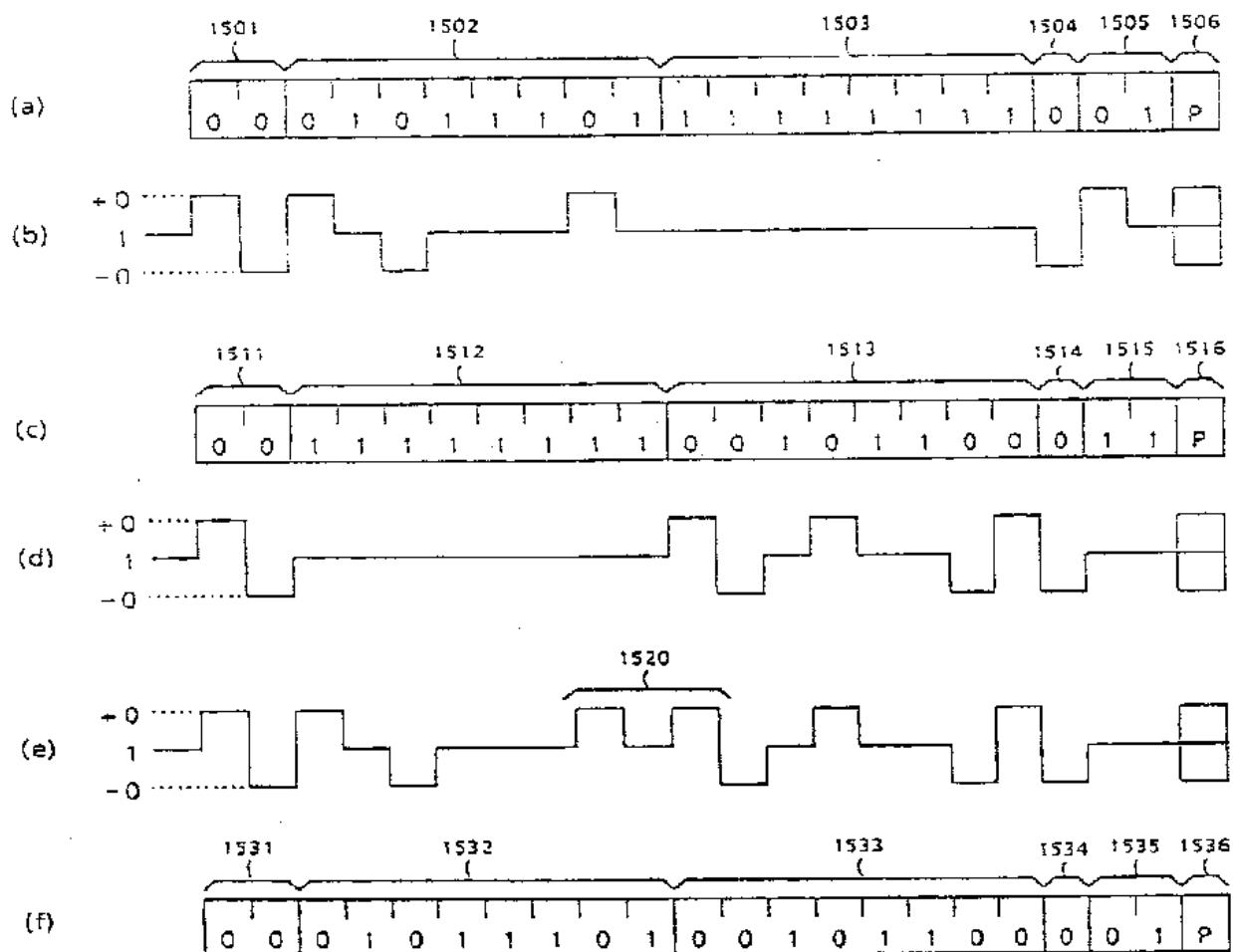
(c) 디지털회선4상의 버스트신호



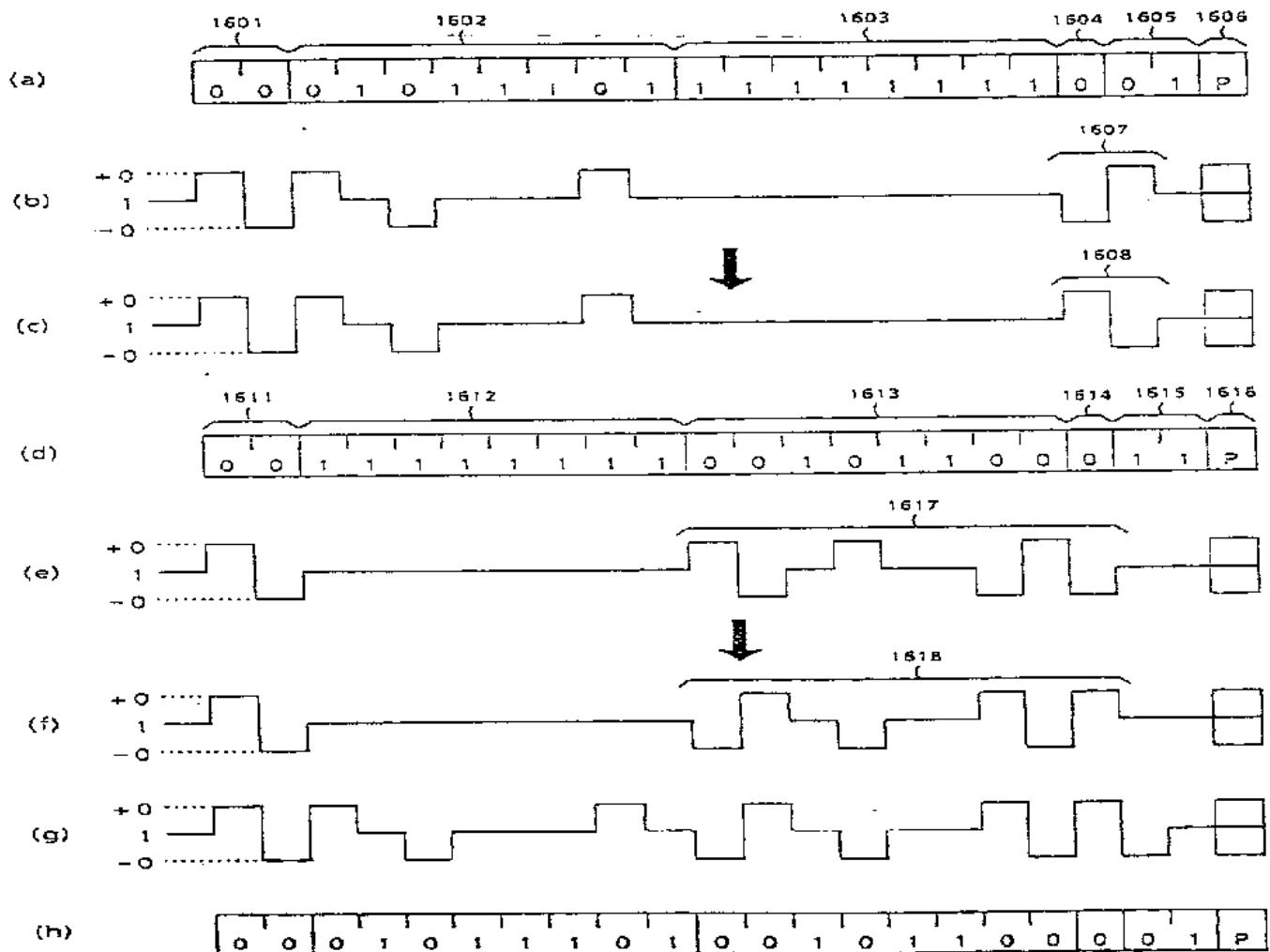
14

AM부호

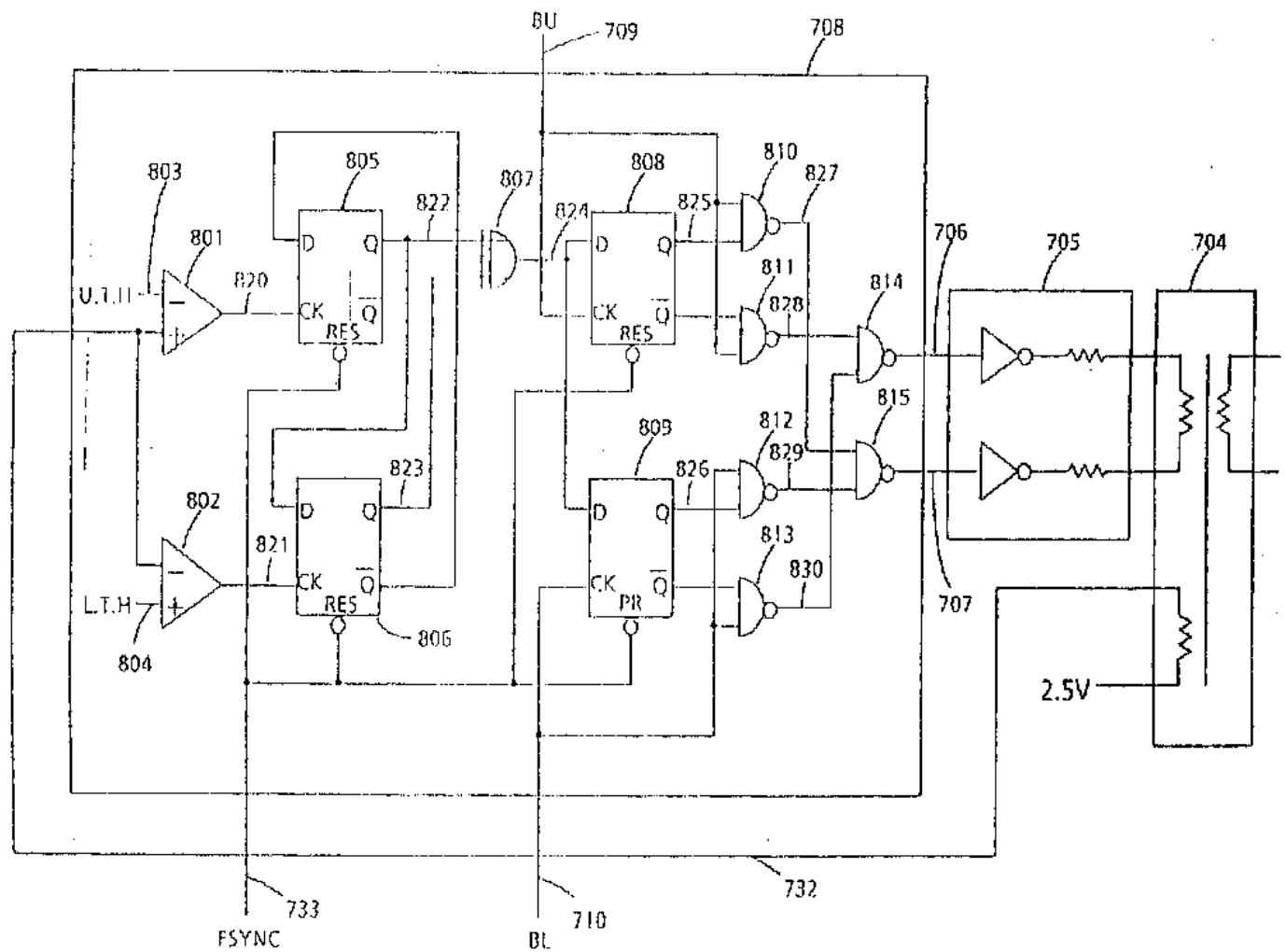
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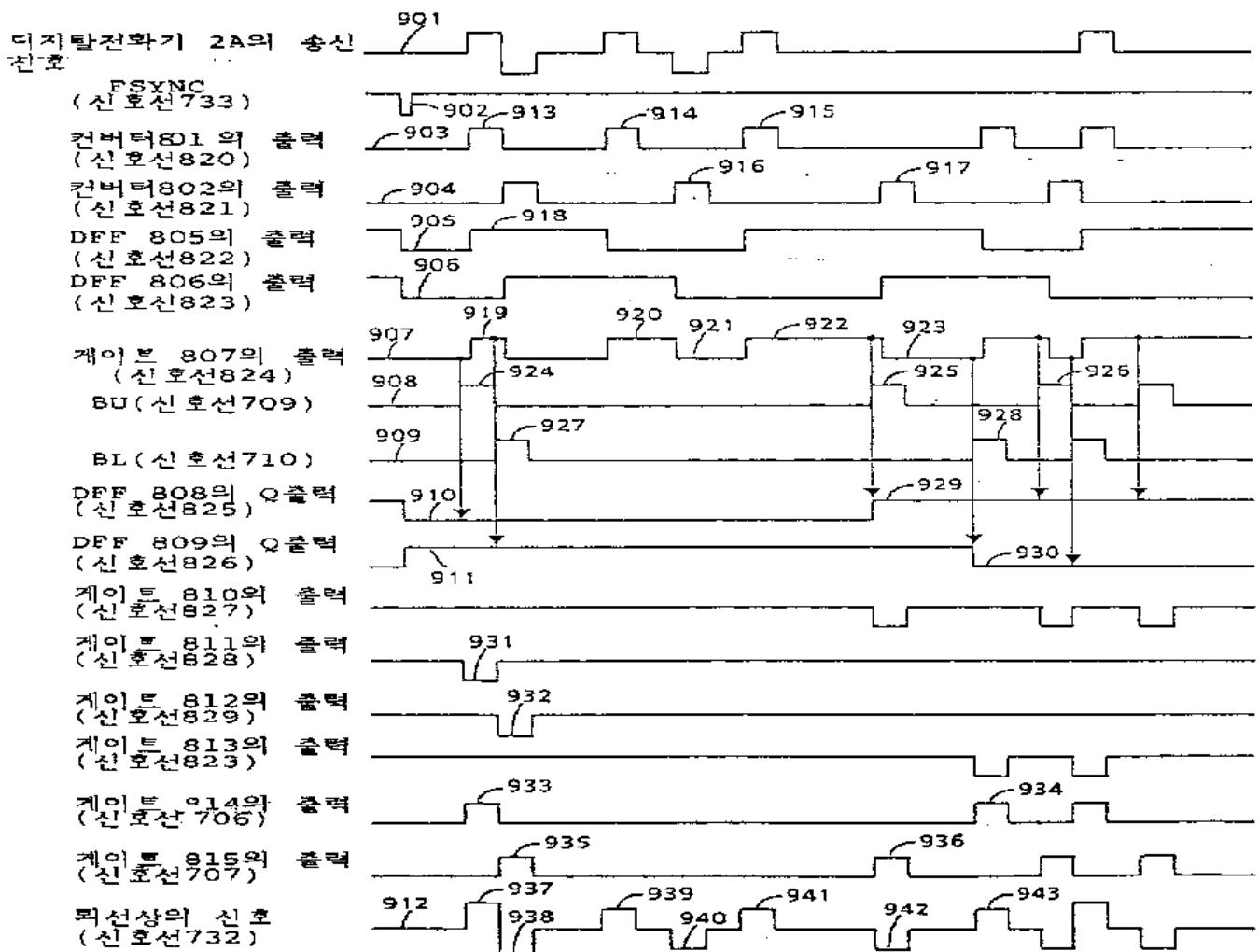


16

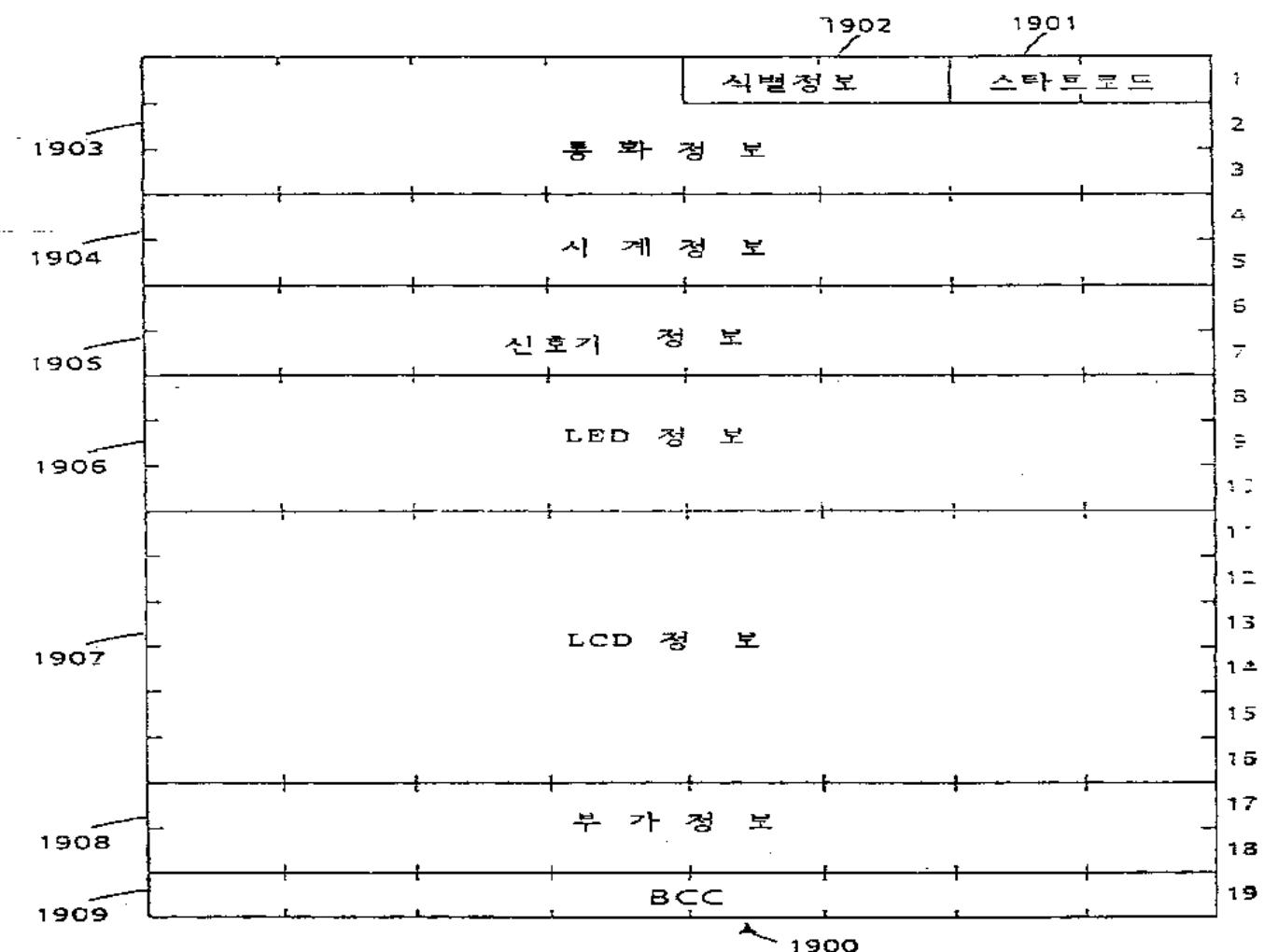


17

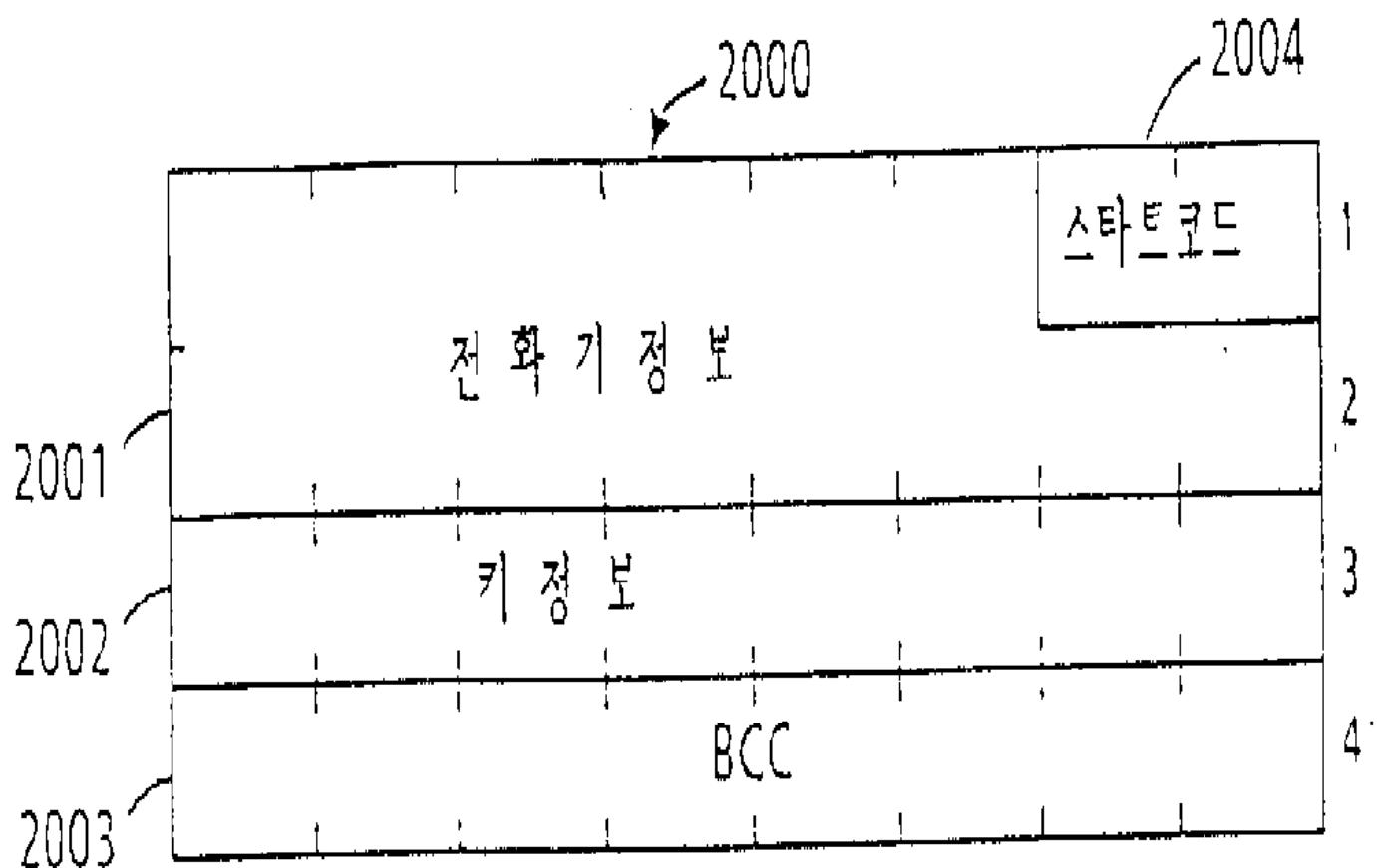


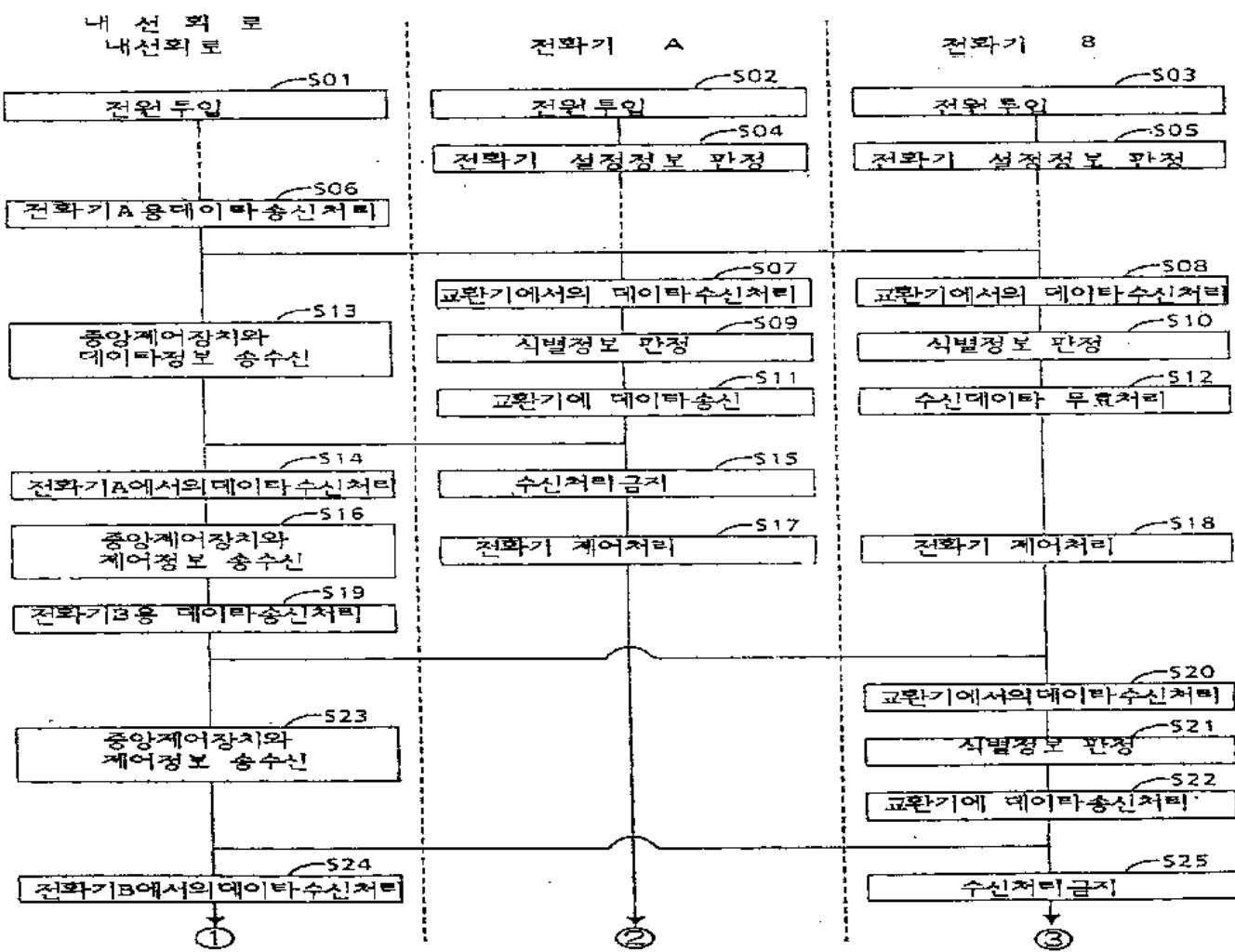


19

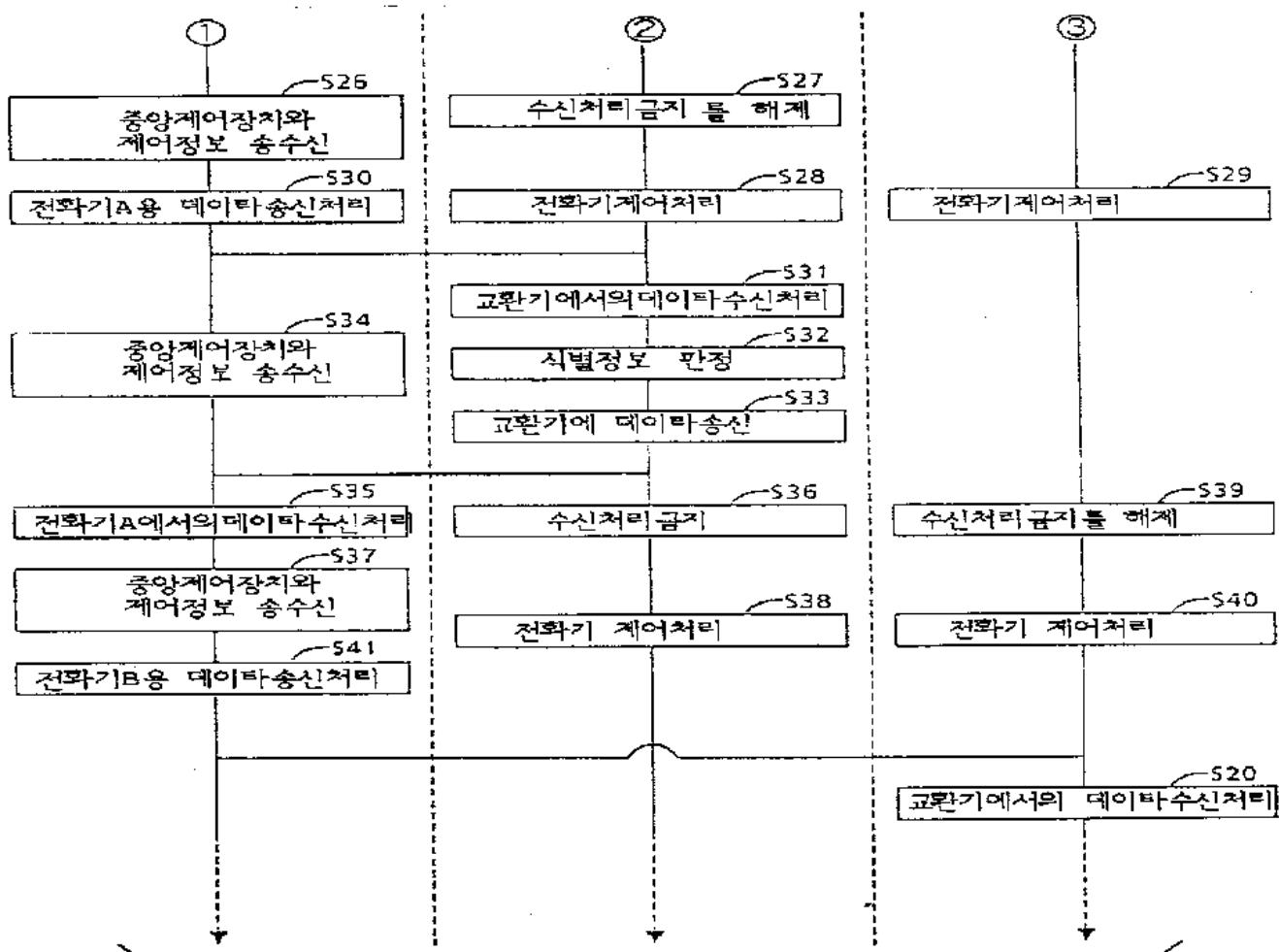


20



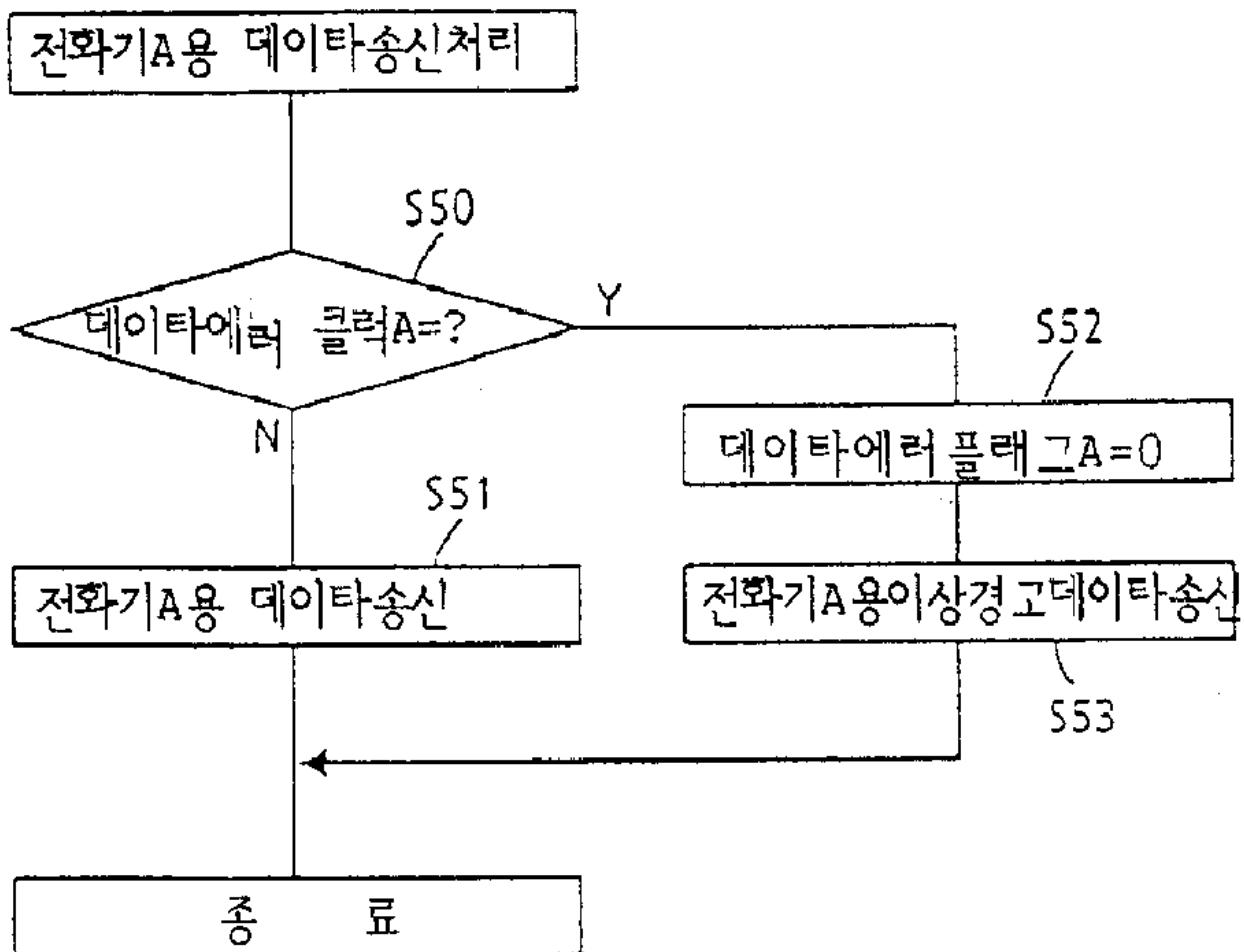


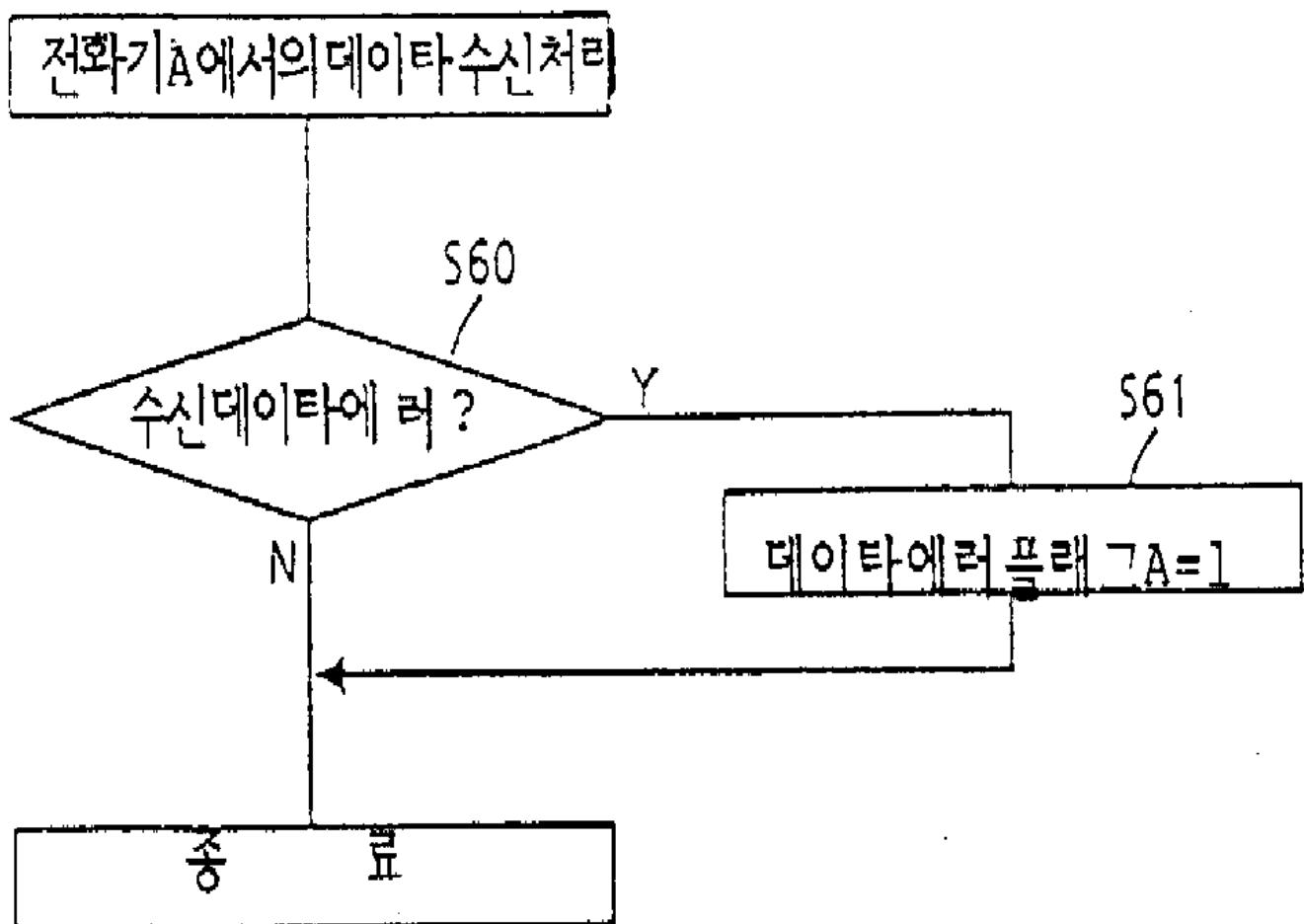
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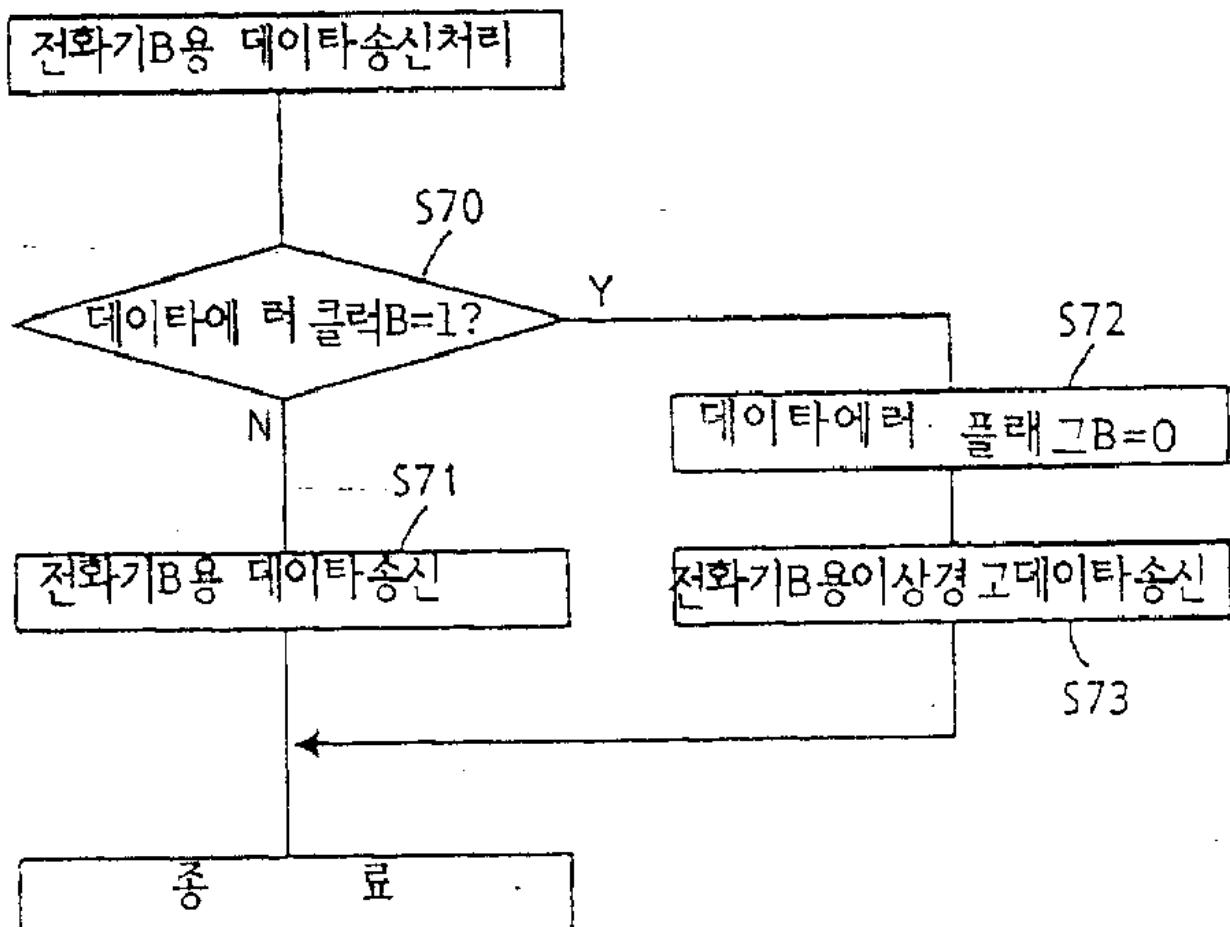


이하, 동일한 처리를 반복한다.

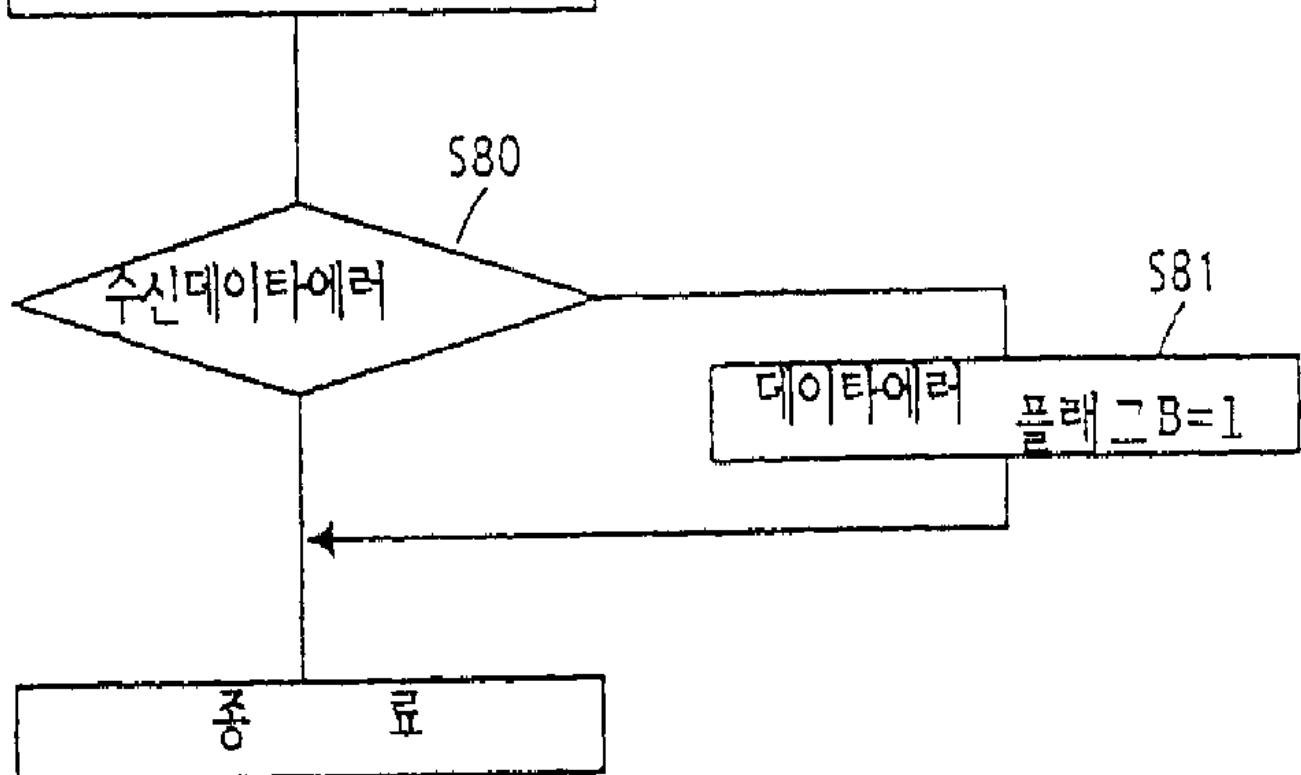
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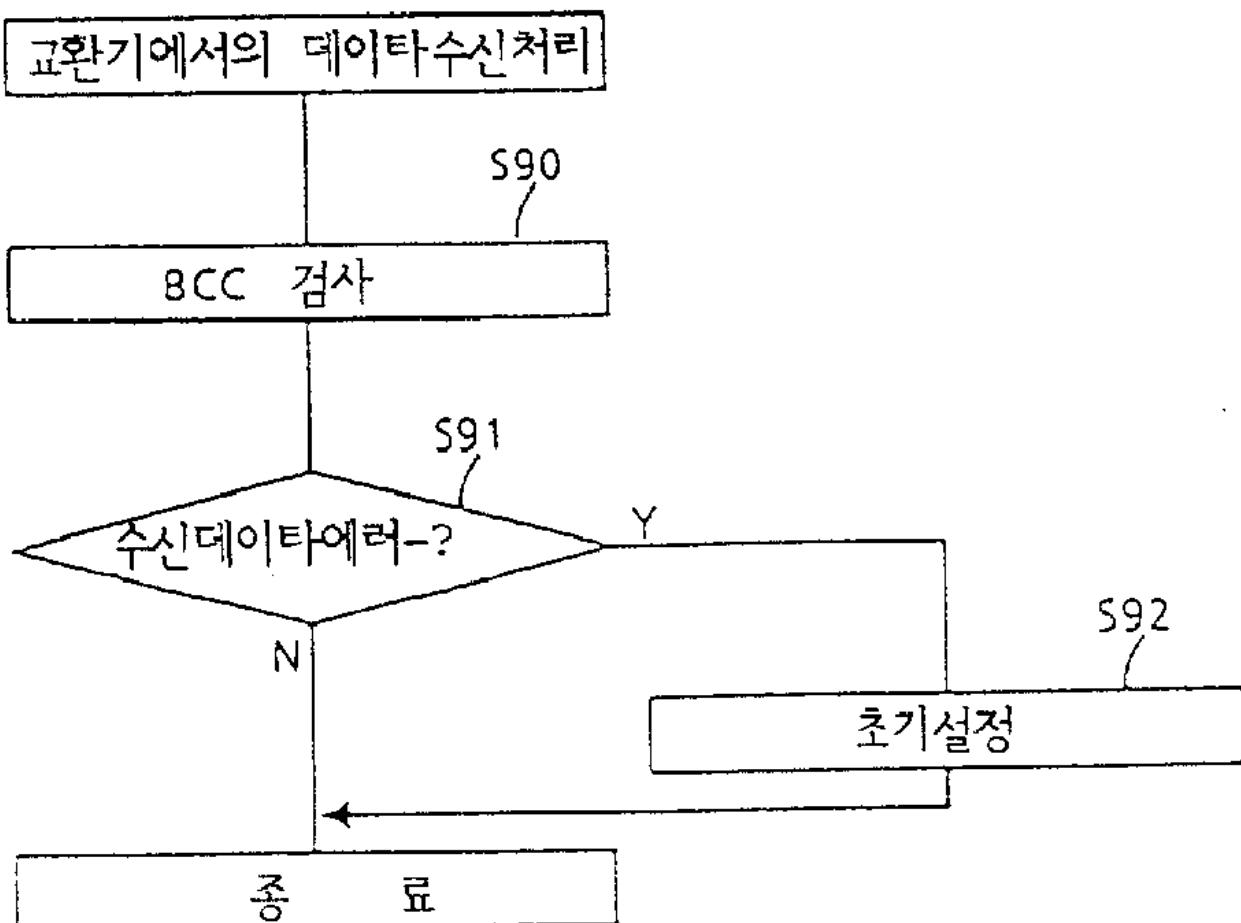




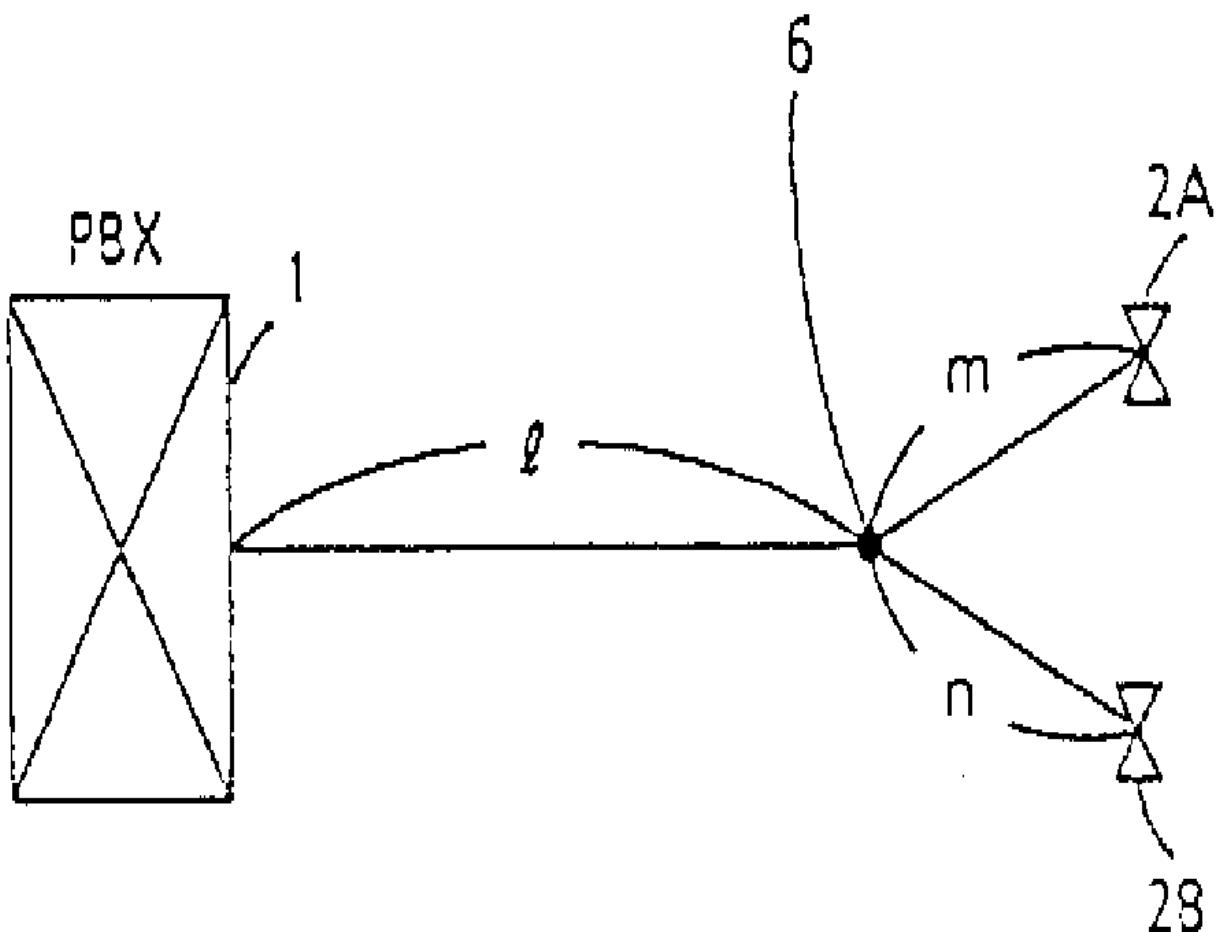


## 전화기B에서의데이터주신처리





28



$I$	$m, n$
저항	선로길이
20Ω	110m (φ0.5)