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H04B 1/69

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(87)

WO 1999/49609
1999 09 30

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(71) 가 가 2 2 3

(72) 2 2 3 가 가

2 2 3 가 가

(74)

:

(54)

, / , 가 , 1 2
FCCH SCH , GSM , , .

1

| | | | | |
|----|---|---|------|---|
| 1 | | 1 | CDMA | . |
| 2 | 1 | | | . |
| 3 | 1 | | | . |
| 4 | 1 | | | . |
| 5 | 1 | | | . |
| 6 | 1 | | | . |
| 7 | 1 | | | . |
| 8 | | 2 | CDMA | . |
| 9 | 2 | | | . |
| 10 | 2 | | | . |
| 11 | 2 | | | . |
| 12 | 3 | | | . |
| 13 | 3 | | | . |
| 14 | 3 | | | . |
| 15 | | 4 | CDMA | . |
| 16 | 4 | | / | . |
| 17 | 4 | | | . |
| 18 | 4 | | | . |
| 19 | 4 | | | . |
| 20 | | 5 | CDMA | . |
| 21 | 5 | | | . |
| 22 | 5 | | | . |
| 23 | 5 | | | . |
| 24 | 6 | | | . |
| 25 | 6 | | | . |
| 26 | 6 | | | . |
| 27 | | 7 | CDMA | . |
| 28 | 7 | | | . |

29 7
30 8
31 8
32 9 CDMA
33 9
34 9
35 9
36
37 (BCH)
38 2 16
39 2
40
41 10
42
43 W-CDMA/W-CDMA
44 2
45 2
46 2
47 2
48 GSM
49 W-CDMA/GSM

(CDMA)

CDMA

가 . . . 3가 . . . , 가 (umbrella) , W(Wide band)-CDMA , 3 , 2 , 가 (25)가 2 , 가 . . . (Network Assisted Handover: NAHO) 2 가 . MAHO NAHO , NAHO (Mobile Assisted Handover:MAHO) 가 , / , MAHO / , CDMA 2 , (TDMA) , / , 2 가 , 2 , 0475 「DS-CDMA (Compressed Mode) (Seamless Handvers) , 8-50 , 36 가 . 36 , CDMA / , 36 , 가 가 . 가 가 . 가 () 가 , 36 , .

, Gustafsson, M. et al: 'Compressed Mode Techniques for Inter-Frequency Measurements in a Wide-band DS-CDMA System', Proc. of 8th IEEE PIMRC' 97. 가 , 16 QAM ,

, 1 1 가 , 가 () 가 . 가 , 가 (fading) , TPC 가 , TPC() 가 가 , TPC 가

, , 가 , 가
2 , 가
가
.

, , 가 ,
.

, , 가 , 가
/ / ,
/ / ,

, , 가 ,
가
.

,
가 .

, , 가 , 가
가 , 가
/ / ,
/ / ,

, , 가 ,
가 ,
가 .

, , 가 ,
가 .

N(N)

N

N

, N

가

가

가

가

가

가

가

가

가

가

가

가

가

가

가

가

가

가

가

N(N

)

N

가

1

1

가

가

N(N

)

N

가

1

가 .

N(N)

N

가 .

가

가

가 1

, 1

가 1

, 1

가 .

/

가 2

1

1

/

1

2

1 2
W-CDMA/W-CDMA

1/2

1 1

2

1

2

, 1 1/2 , 1 1 2 , ,
, 1 2 W-CDMA/W-CDMA , , .

가

가 , 가 , 2 , ,

가 , , , , .

가 , , , .

/ 1 , , 2 / , 1 2 , ,

1 2 , , .

1 2 , , .

, 1 , , 1 1/2 , 1 2 , , , , .

, 1 1/2 , 1 , 2 , , 1 1 2 , , , , .

가 , 2 1 , 1 , 1

가
가
가 .

2 , 1 .

가

가

, ,
1 가 2 , 1 ,
가 가

, , 가 가
2 1
가 가

, , 가 가
2 1 1 N(N
) 2 1

, , 가 N
가 1 2 가 1
2 가

, , 가
가 1 2
가

, , 가
1 1

2

가 .

1 1

2 2

1

1

가 .

1 1

2 2

3 2 2

1

가

1 1

2 2 3 3 1

2 4

가 1

1

가 .

1/2 , 1 1 1 2 , 1 ,
 2 , 1 2 2 ,
 , 1 1/2 , 1 1 2 , ,
 , 1 2 W-CDMA/W-CDMA .

가 , 가 , 2
 가 , , 가 , ,
 , , 가 , ,

1/2 , 1 , 1/2
 1 2 , 1 2 , , 1 1
 , 1 1/2 , 1 , 2 , , 1 1
 2 , ,

, CDMA 1 CDMA
 , CDMA (1A) (2A) , 1 CDMA .
 A), (1A) 1 (11A), (12), (13), / (14
 A) (13), (15) / (14A) (11A) (15) (negotiations) (11A) (2
 (11A) / (14A) , (11A) (15)
 가 , (11A) (15)

(12) 가 (13)
 , (interleave) .
 (13) 2 (11A) '1' 1 , '2'가
 2 .

/ (14A) , / (14A) , (11A) (15) .
 / (14A) , (11A) (15) / (14A) (11A)
 가
 (2A) 1 (21A), (22), (23), / (23)
 (24A), (24A) (25) (21A) , (1A) , (24A)
 / (21A) , / (24A)
 (25) / (24A)
 (2A) / (24A) (21A) (25) /
 (24A) , (21A)
 (23) (1A) (23) , (13) 가 2 '1'
 1 (21A) , '2'가 2
 (22) ,
 (13) (23) 2 1
 2 , 2a (13) (131A)가 2b (23) , (13)
 , 2 1 , 2 가 (13), (23)
)
 가 (2a) , (131A) , 1 () , 1 가
 , 2 가 (2b) , (131A) , 2 () 가
 (23) ,
 3 , F 3 , CDMA / 3 1
 가 3
 가
 (1A) (2A) , 2
 (13), (23) , 1
 5 (1A) 4 5 (11A)
 4

(4), '1' (13) (S101), (13) 1
가 (S102), / (14A)
) (S103).

(5), '2'가 (13) (S111),
(13) 2 가 (14A) 1 (S112), / (S11
3). (15) 가가 (S114), ()

(2A) 6
7 6 7 (21A)
(S121), / (24A) (6), 1
'1' (23) (S123), (23) 1 (S122). 가

(7), 1 (S131),
/ (24A) (23) (S132). (23) 2 ,
가 '2'가 () 가

1 , , 가
가 가 .

가 ,
가 .

1 , ,
2 , , 2 1 , ,

(131B) 2 CDMA 8 2 CDMA (13)가
가 1 (13) 1 (23)가

9 , / 9 2 . CDMA
가 , 가 ,

가 .

1 가 , 1 ,

10
0), 1 11 가 (13) (S201), (13) 1 (1
가 .

(S204), (S203). (S202), / (14A) 가가 (15) , , () . , (S211), / (11), 1 (24A) 가 (23) (S212). , 1 (S213), (23) () . 1 가 , 2 , 가 , 가 , 가 . , 2 , 2 , 1 가 , , 가 가 . , 1 , 3 , , 2 3 , 2 , , 12 , 3 / , . CDM A , , 가 , , 가 , , () , 1 가 , 1 , 가 N(N) , , N=2 2 , N=4 , N=1, 2, 4 , 4 . , 14 가 (13) (S301), (13) 1 (13) , 1 가 N (S302), / (14A) 가가 (S303). , (15) , , (S304), () . , (14), N (S311), / (24A) 가 (23) (S312). , 1 (S313), (23) 1 , 1 가 () .

, 3 , N
N / 가

, N
가 , ,

, 3 , 2
가 , 1 가 ,

, 1 3 , 4 ,

, CDMA 15 4 CDMA
CDMA (1B) (2B)
CDMA

(1B) 15 (11B), (12), (13), / (14B), (15) (11B) (2B) (11B) / (13B), / (14B) (15) (11B) / (14B)

, (12), (13) (15) , 1 ,
(13) , 1

/ (14B)

, / (14B) (11B) (15) , / (14B) (11B) 2 (1)

, / (14B) 2 (14B) 1 가 , 1 , 2
(13) 2

(2B) 15 (21B), (22), (23), /
(24B), (25) (21B) (21B) (1B) (24B)
(23) / (24B)

, (22), (23) (23) , 1 ,
(23) , 1

/ (24B) / (24B) (14B) 가 1
(24B) (21B) (25) , / (24B)

, (21B) (23)

, / (14B) / (24B) . 16

4 / (14B) 16a / (14B)
 (141A)가 16b , / (24B) , / (14B)

4 , 2 가 / (14B) , 2 / (24B)
 , 1 (13), (23) 1 2

(16a), (141A) (13)
 , 2 가 (13) (16b), (14)
 B) (141A)가 / (24B) , 가

17 , F . CDMA / 17 4
 , 17 , 가

가 , , 가 , (1B)
 , 17 (,) , (#1, #2)
 , () , (#3 #4)

(1B) 18 18
 , 1 (11B) 가 (13) (S401), (13) 1
 가

(S402), / (14B)
 (S403). , / (14B) , 2
 가 , ()

19 (2B) 19
 (21B) , (S411), / (2
 4B) (S412).

1 가 가 (23) (S413), (23)
 , ()

가 , 4 , ,
 , / ,
 가 .
 , , 가 .

4 가 , ,
 가 , ,
 가 , ,
 1 4 , , 5 ,
 , CDMA 20 5 CDMA
 , CDMA (1C) (2C) , ,
 , CDMA
 (1C) 20 , (11C), (12), (13), /
 (14C), 3, / (14C) (15) (11C) , (2C) (11C) / (14C) (1
 (11C) , (15)
 1 4 .
 , (12), (13) (15) , 1 ,
 (13) , 1
 / (14C) , , / (14C) , (11C)
 (15) , /
 (14C) , (11C)
 (2C) , 20 (21C), (22), (23), /
 (24C), (25) (21C) (21C) , (1C) / (24C)
 (23)
 , (22), (23) (25) , 1 ,
 (23) , 1
 / (24C) (21C) , / (24C)
 (25) ,
 (21C) (23)
 , 21 5 . CDM
 A , 21 , / , ,
 , 가 , , 가 ,
 가 , , 가 ,
 , 21 , , 가 ,
 (1C) , 22 , 22
 (11C) , (13) , (S501), (13) 1
 , 1 가 가

6, 2, 가, 가, N

6, 3, 가, N

1, 6, 7, 가

CDMA, CDMA, CDMA, 27, 7, CDMA

(1D), (2D), (1D), (2D)

(1D), 27, (11D), (12), (13), /

(14D), (15), (11D), (2D)

(13), / (14D), (15), (11D) / (

14D), TPC, (11D), (15), (2

(12), (13), (15), 1

(13), 1

(15), (11D)

/ (14D)

(11D)

(15)

(2D), 27, (21D), (22), (23), /

(24D), (25), (21D), (1D), (24D)

(23), / (24D)

(22), (23), (25), 1

(23), 1

(25), ()

(21D)

/ (24D), (21D)

(25), / (24D), (23)

(21C), / (24D), TPC, (21D)

TPC

TPC, 28, 7, (11D), (2D)

(21D), TPC, 1, +1.0dB()가

) 0() 2, 1() 11.0dB가

, 0()

1dB가

, 1() +3.0dB() , 0()

13.0dB가 , 3 dB가

가 가 (

)

가

(1D) 29 (2D) 7

(1D) TPC (S702). (2D) TPC 가 ((15) (2D) S701), 가 (1D) 가 (S703)

+3dB , TPC 가 1 , 가 , 28
 가 13dB , TPC 가 0 , (15) , 3dB 가
 가 (15) , 28 3dB

가 7 , , 1 가

가

7 , 3 , N

7 , TPC 가 2 , , 가
 8 , 7 , 가
 8 , 27 ,

, TPC 30 30 8 (1D) (11D) (2D)
 (21D)

1B; B 2 8 , TPC , 2 , 4 (1
 10B 2 ,), 10B, 01B, 00B) TPC 가 TPC 11B

, 11B, 00B 7 , 2 , TPC 가 2
 11dB , TPC , 11B , +1dB , 00B
 가 7 , TPC 가 11B

가 3 +3dB , TPC 가 00B 가
 3 13dB , TPC 가 10B , +1dB , 01B
 4 -1dB

, TPC 가 11B +1.0dB() , 00B
 , 10B -1.0dB가 , 1dB가

, TPC 가 11B +3.0dB() , 00B
 3dB가 , TPC 가 11B 00B

, TPC 가 10B +1.0dB() , 01B
 1dB가 -1.0dB가 , TPC 가 10B 01B

() 가 , .

, 8 가 ,

. 31 8

(1D) (2D) , .

(1D) (2D) TPC 가 (2D) 가 (1D)

TPC 가 (S801), TPC 가 (S802).

30 S802 가 (S804).

03). (15) (S804).

, TPC 가 11B 가 30

+3dB 가 (15) , 3dB 가

30 가 , TPC 가 00B , 3dB

13dB 가 (15) , 3dB

, TPC 가 10B 가 30 +1dB

가 (15) , 1dB 가 30

-1dB 가 (15) , 1dB

, 8 , , ,

, 가 .

, 7 TPC 가 가 7

TPC

, 3 , N

, 가 .

, 1 8 , 9

, 9 CDMA

32 32 9 (100), 가 (110), (120), (100)

, (200)

, CDMA

(#1 (100) 가 (#1 #M) , (#1) (11E), (12), (#1)

) / (14E), (16) (13E), (13)

(11E) , (200) (13), / (14E)

(16) (11E) , / (14E) ,

, (12), (13) 1, (13)
 , 1
 / (14E), / (14E), (11E)
 (14E), (11E) (16)
 (16) / (14E) (11E)
 (#1 #M) (#1 #M)
 (16) (#1 #M)
 가 (110), (100) (#1 #M) 가
 (120) (120) , 가 (110)
 (120) 1
 (200), 32 (201), (202),
 (203), (204) (201) (100)
 (202),
 (201)
 1 가
 (203), (204)
 33 9
 . CDMA () 가
 가 가
 가
 , 33 , 32 (M1, M2) 가
 , 1
 1 M1, M2 () , (M1,
 M2) (A, B)가
 M2 () , (M1, M2) (C)가 (M1,
 (C) (T2, T1)
 (#1 #M) (14E)
 34 9 34
 (11E) 가 (13) (S901), (13) 1
 가 (S902).
 (200) (200)가 ()
) (16) 가가 (14A) (S903).
 (S904),

()

(200) 35 9

(200) 가 35 (201) (#1 #M)

가 (S911).

(S912)), (S912)

(S911) S913).

S913 가 ,1

(S914).

,1 가

S915). ,1 () (

가 (S911)

9 (200) (100)

가 1 (100)

1

가

9 2

가 가

9 3 N

가

1 9

가

1 9 가 가

1 9

가

37 (BCH) W-CDMA 1 37

a ,16 #1 #16 ,1 37b

4 ,10 (1) 'P'

'FSC(1)' 'D1 D5' 5

1 , 1 2)' 'SSC(2)'

, W-CDMA
() , () 2 (37c
, 37d). (P) (D1 D5) , 가 ,
(COMMON, C+Walsh)가 . ,

() , W-CDMA

W-CDMA , , 3 , 가 .
W-CDMA , , 3

, 1 , 1 (FSC: F
irst Search Code)

, 2 , 1 , 2 (SSC: Second Sea
rch Code) 16 , , 2

, 2 , 16 , 2 , 38 , #1 #
16 1 2 16 , , 2

, Slot# 39 , Group
, 2 , 17 (1 17) , 16

, 2 , ,
, ,

, 3 , , 가

40 , , 37

, 1 , 1 (S921).
, 1 가 (S922).

1 가 (S922, YES), , 가 , 2 1
6 2 가 (S923).

2 가 (S924, NO), (S925),
S923), (S926), (S927, S928).

, 2 가 (S924, YES, S928, YES),
, 가

31, S932, YES), , 3 , (S9
가

(S933), 가 (S934, YES), 2
(S923), (S934, NO), S931 가

(가),

가 , 1 , 1 , 2

, 1 9 , 16 가 , 1 , 2
가 , 1 , 16 가 ,

, 1 1/2 , 2

가

41 10 , ,

41 , (2E) , (21E), (22), (23), / (24E),
 (25), (51), (52), (53) , ,

(21E) , (23), / (24E)
 (53) , (21E) , (21E) , (53), /
 (2E), / (51) , (53) / (51)가 .

E) , (25) , / (24E)
 (2E) / (24E) , (21E)
 / (24E) , (21E) (25) , ,
 (23) , (22)
 ()

, / (51) 1 2 1 2 .
 (52)

(2E) , 42 (: f1)
 , , (: f2)

, (2E) . 43 W-CDMA/W-CDMA
 , (52) , (21E)가 .

, (S941).

, 1 , (S942). , 1
 , 1 가 (S943), (S944), 1
 / (51) , (53)가 (21E)

1 2 16 2 가 (S943, YES), 가 , ,
 44 2 , 16 (21E)가 1 (S945). 2 , 1 , 1 2
 , 16 2 .

, 2 , , 45 , 1
 2 2 가 (, 2 , 44 , 8 2
 , , 46, 47 ,)
 , , 가 1 , 1/2 , ,
 2 , , , 가

가 (45) 47 가 S945
 () 2 가 (S924, NO),
 S925), (S9
 26), , 2 , , , .
 가 2 가 (S924, YES, S928, YES), ,
 가 , 가 .
 3 , (S9
 31, S932, YES), , 가 (S9
 (S933), 가 (934, YE
 S), 2 , (S934, NO), S931 가 ,

GSM(Global System for Mobile communications)

가 41 (2E)
 / (51) , 1 2 , FCCH SCH .
 48 , GSM , 48a GSM , ,
 FCCH(Frequency Correction CH), SCH(Synchronisation CH),
 , 48b , GSM TCH(Traffic CH) , 49 , W-CDMA/GSM

W-CDMA , 1 , GSM 가 가
 가 (S951, S952).
 , 2 , FCCH
 , GSM (S953). , GSM , 51 1
 , 5 FCCH가 , W-CDMA , 5 , W-CDMA
 (S954, S955). , FCCH 48a FCCH/SCH , W-CDMA
 가 , FCCH , W-CDMA/WLCDMA 가 ,

3 , FCCH SCH
 , GSM (S956, S957, S958). , FCCH , SCH
 , () 가 , FCCH , SCH
 가 , SCH , FCCH , FCCH , SCH ,
 , FCCH , SCH , SCH , W-CDMA
 , FCCH , SCH , GSM 가 .
 (W-CDMA/W-CDMA , W-CDMA/GSM)

1 10 , ,
 / , , , ,
 , , , ,
 , 가 , / 가 가 ,
 , , , 가
 , (CDMA)
 , (W-CDMA/W-CD

MA , W-CDMA/GSM)

가

(57)

1.

(communication partner apparatus)

2.

1

N(N)

3.

가

4.

3

N(N)

5.

1

1

2 ,

2

3

6.

1 ,

가

1

2

2

3

7.

(transmission gap)

가

(power control step sizes)

가

가

8.

7

가

가

9.

1

2

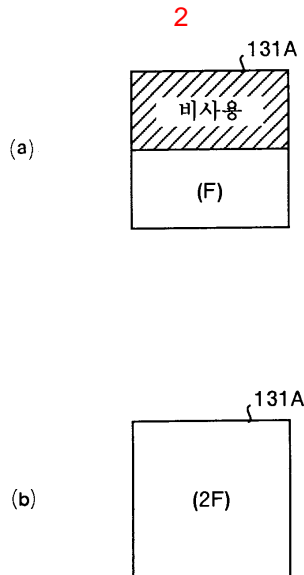
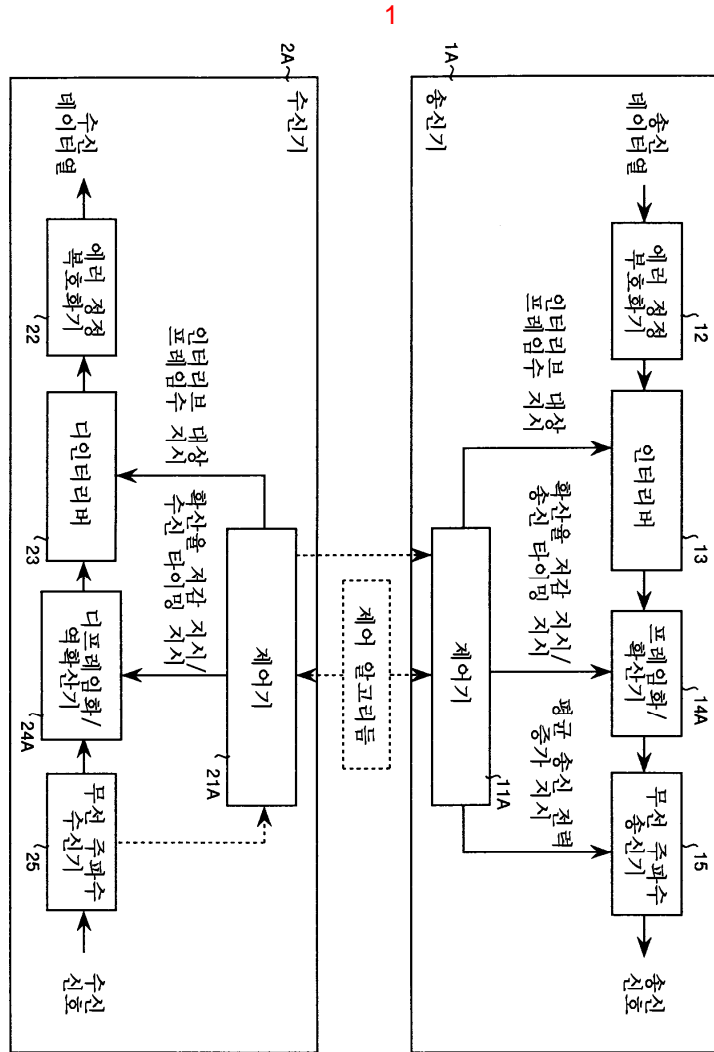
2

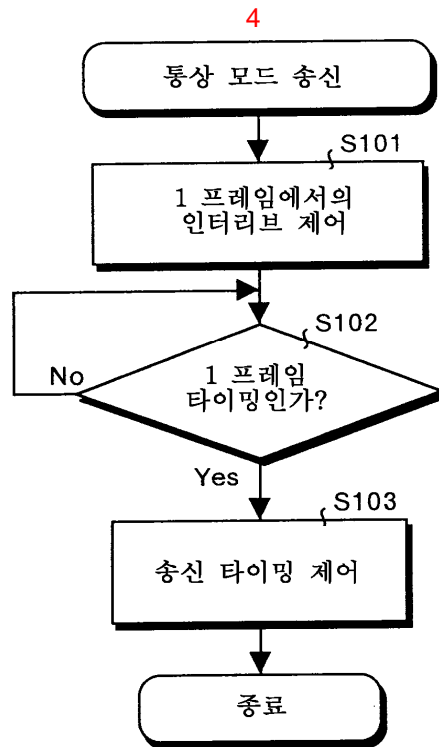
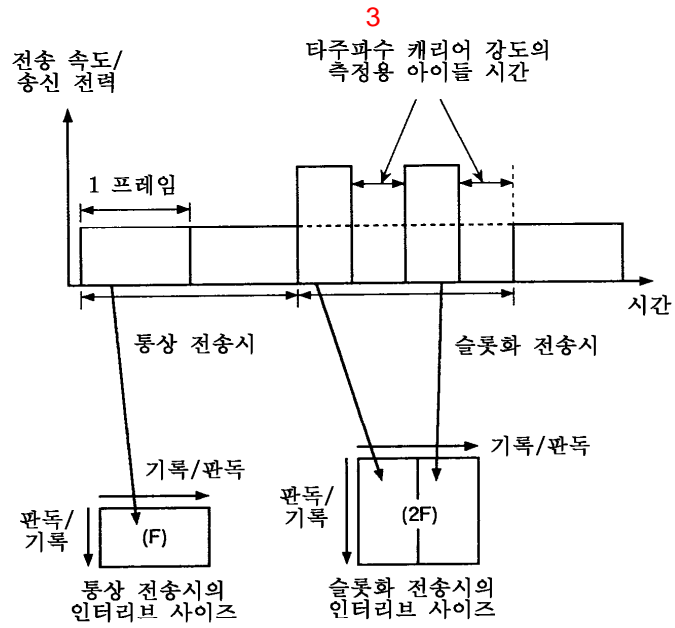
1

10.

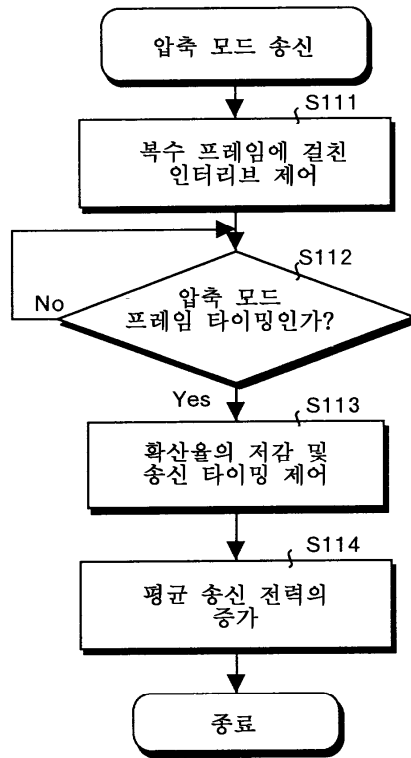
9

가

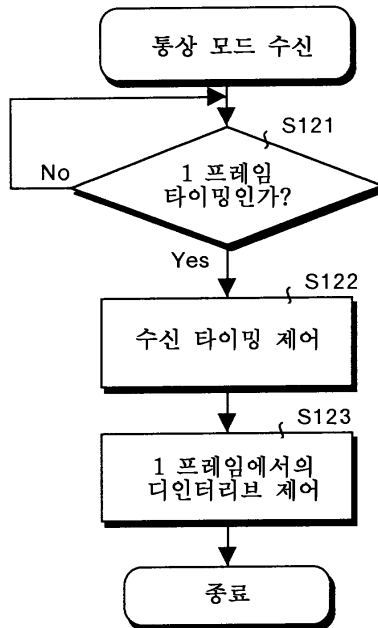




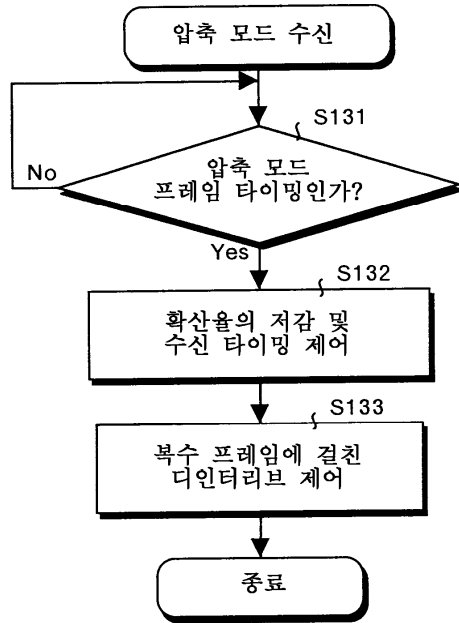
5



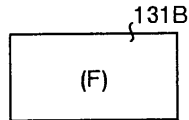
6



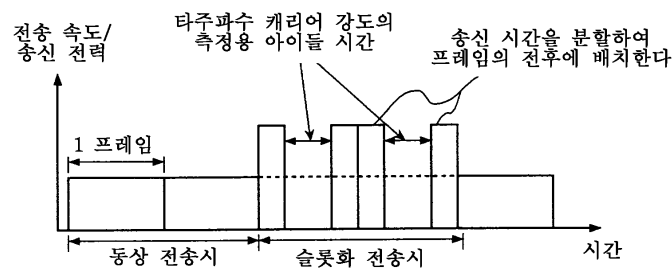
7



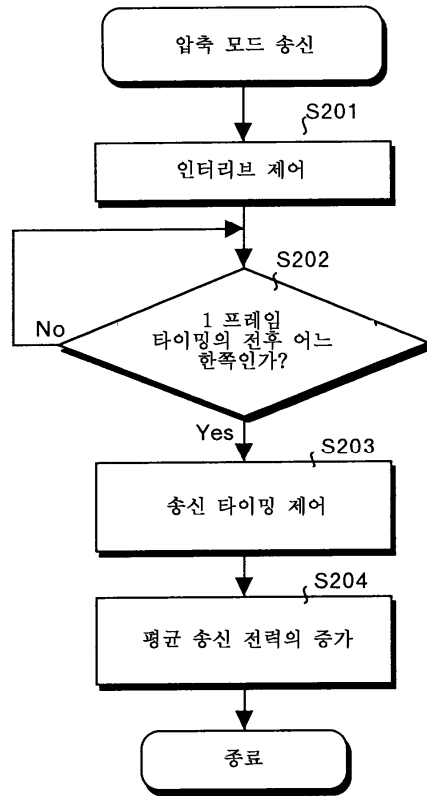
8



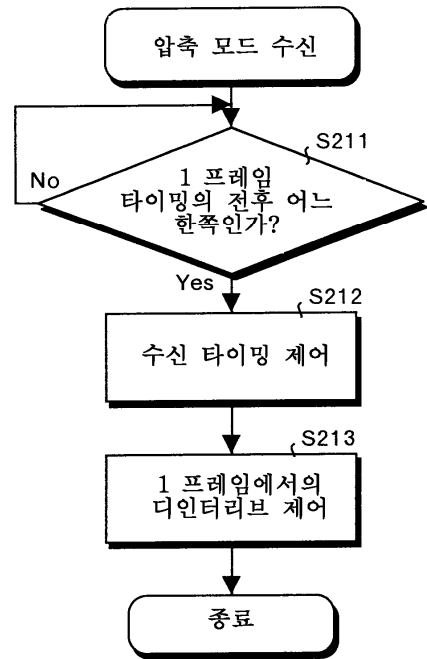
9



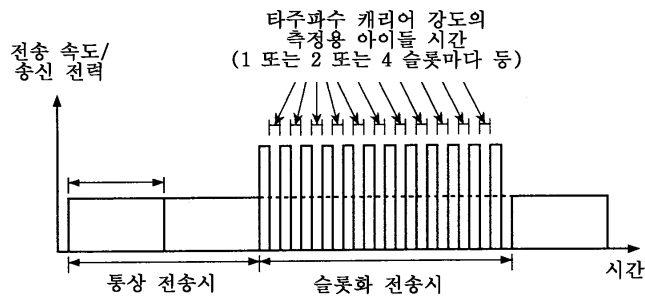
10



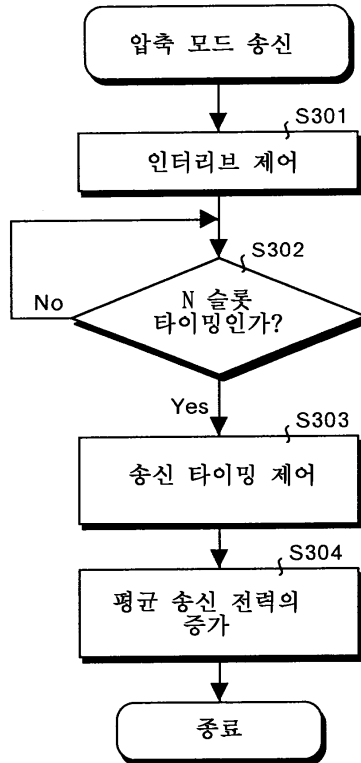
11



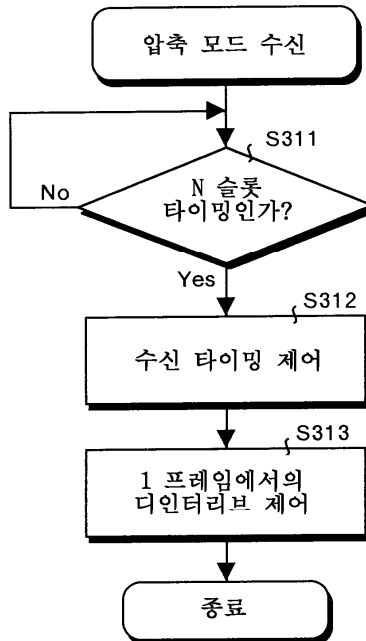
12



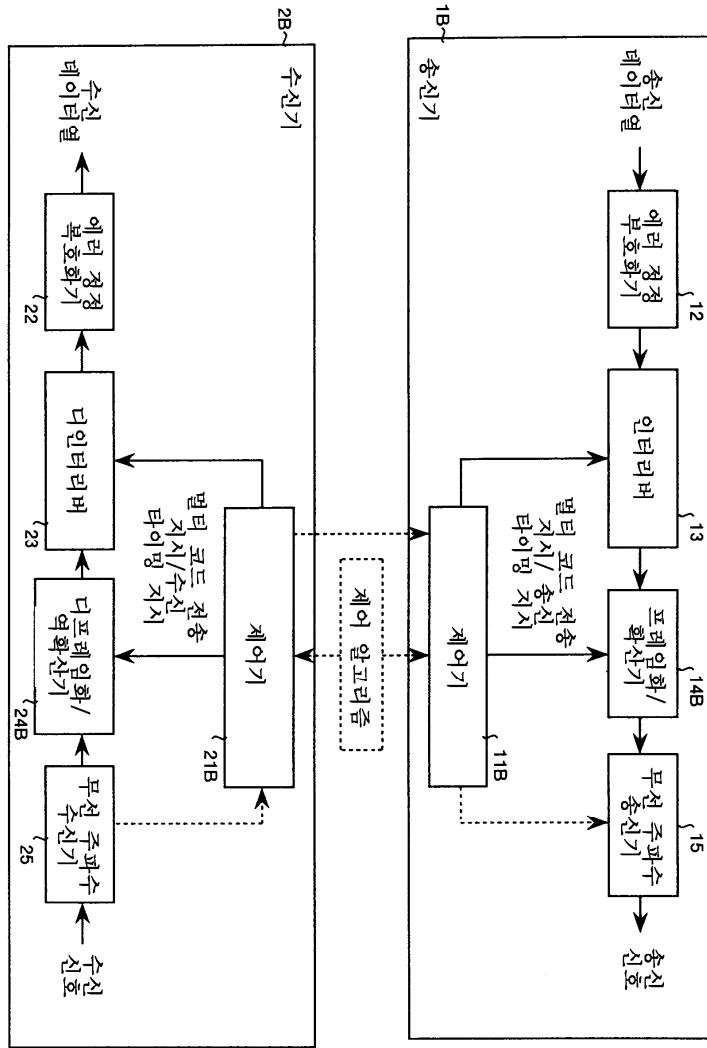
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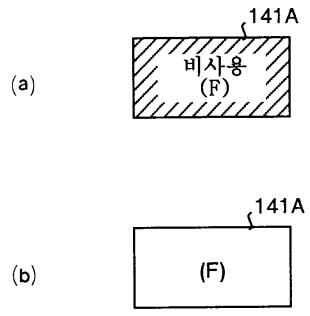
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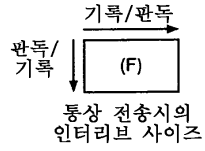
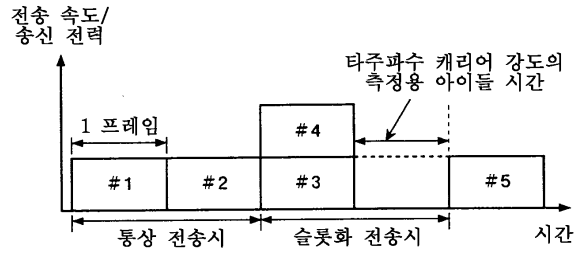
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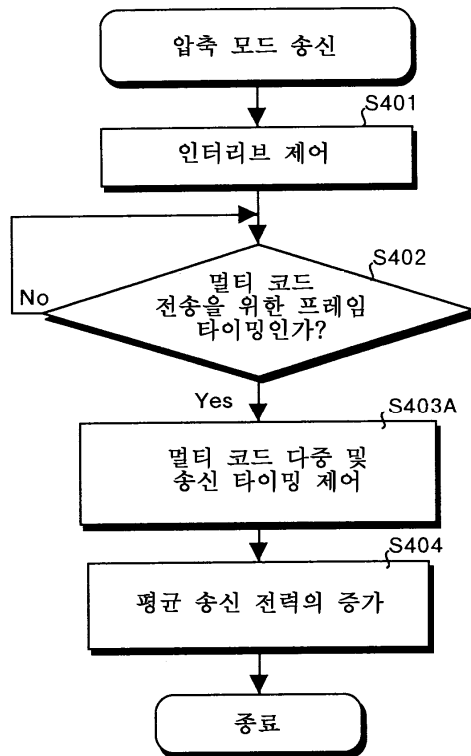
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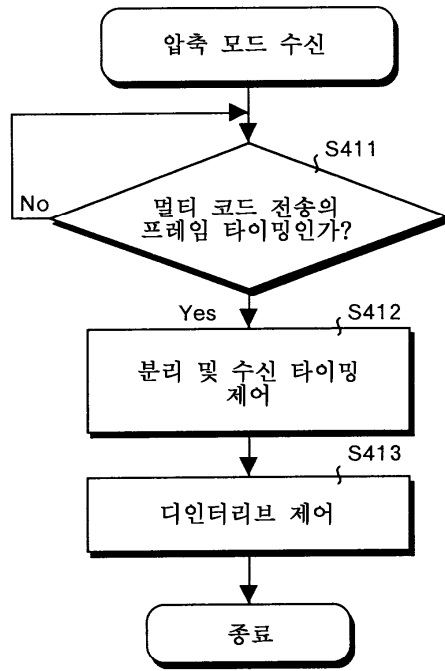
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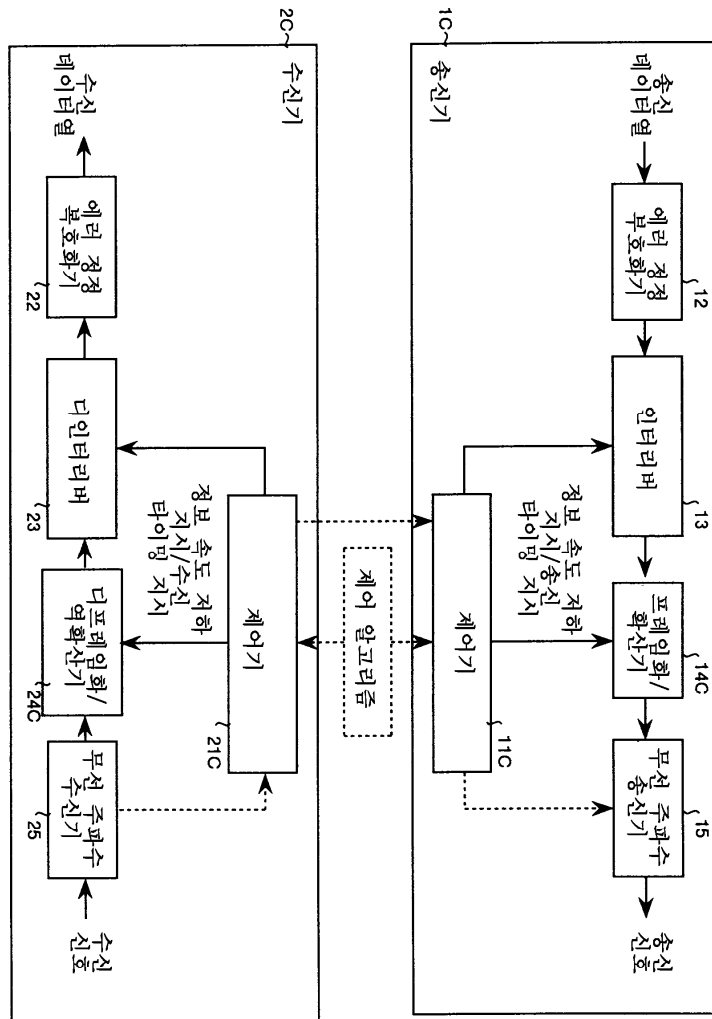
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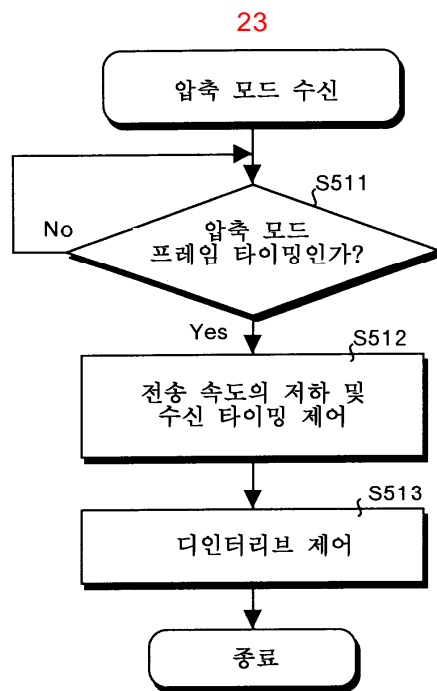
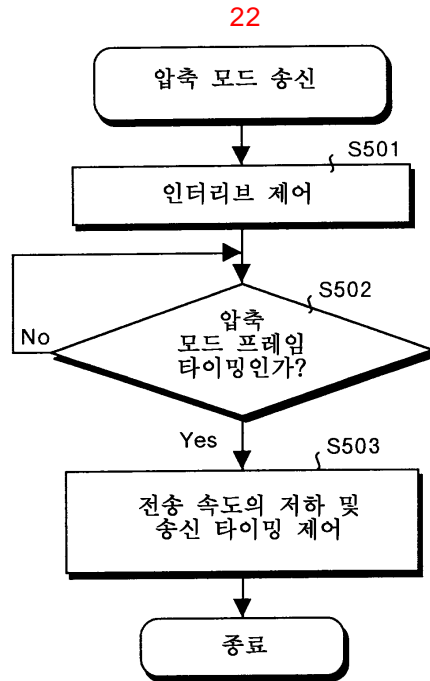
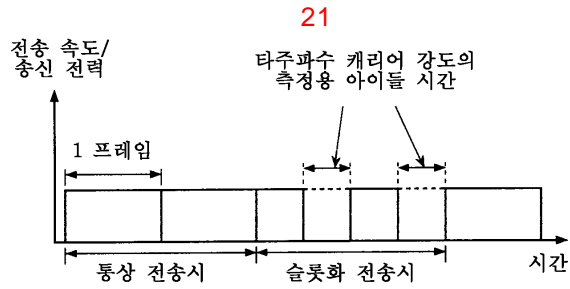


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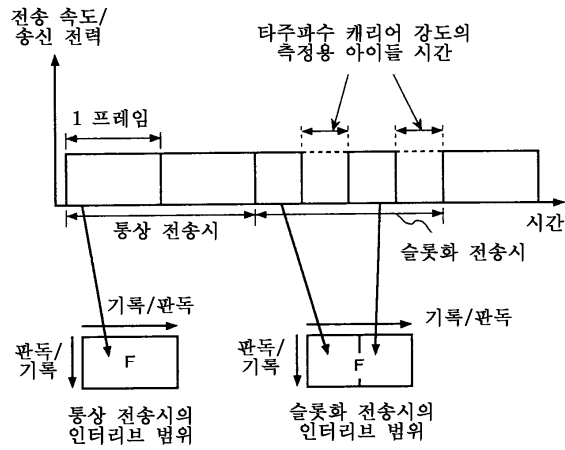


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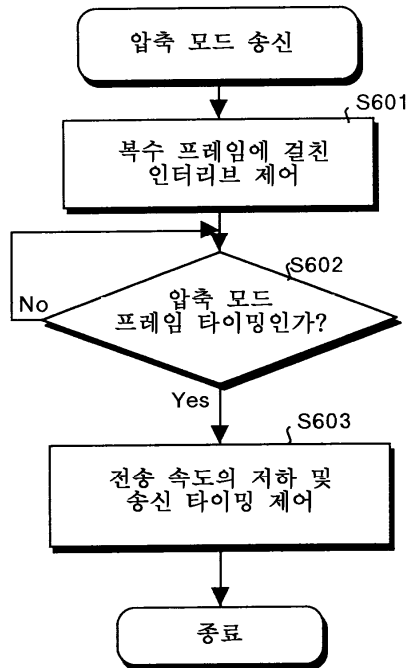




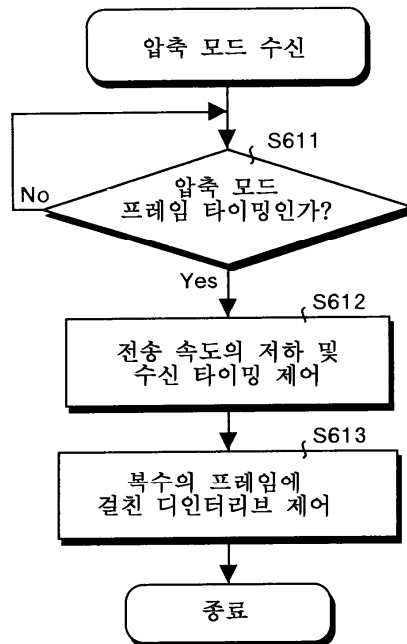
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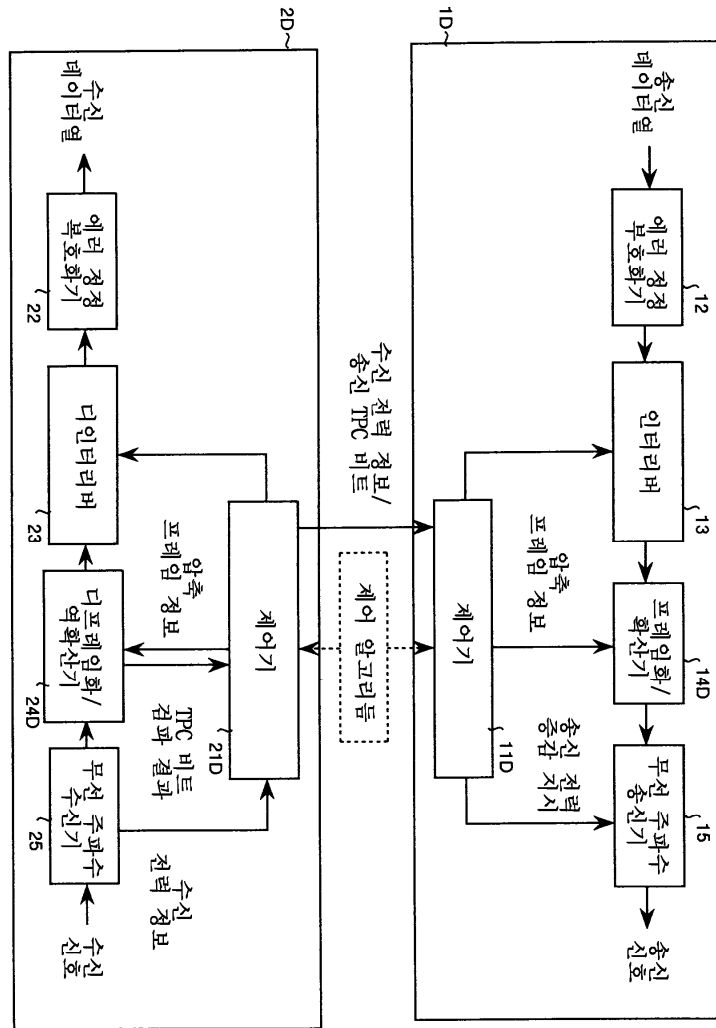
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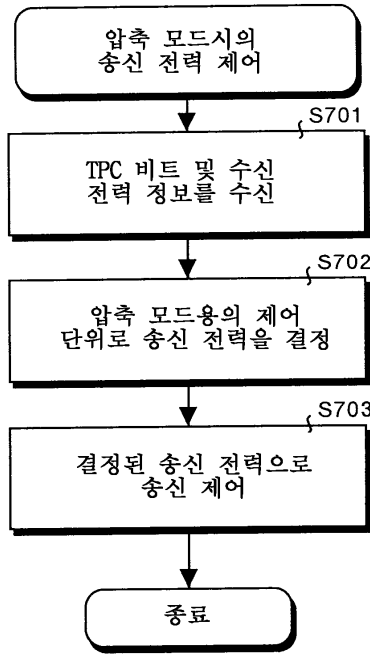


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111A

| TPC 비트 (1 비트) | 송신 전력 제어량 | |
|------------------|-----------|--------|
| | 통상 모드 | 압축 모드 |
| 1 | +1.0dB | +3.0dB |
| 0 | -1.0dB | -3.0dB |

29

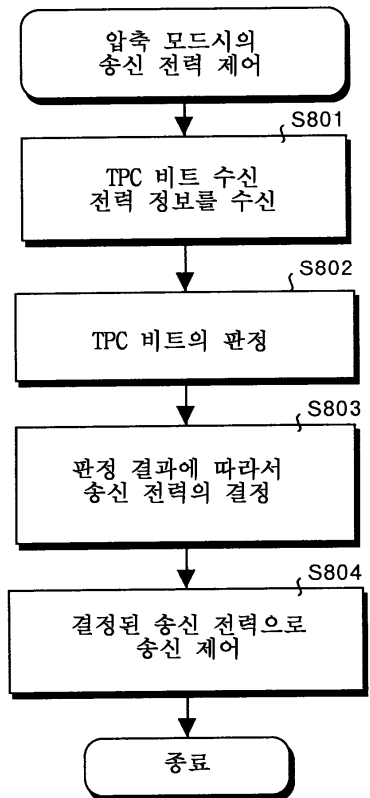


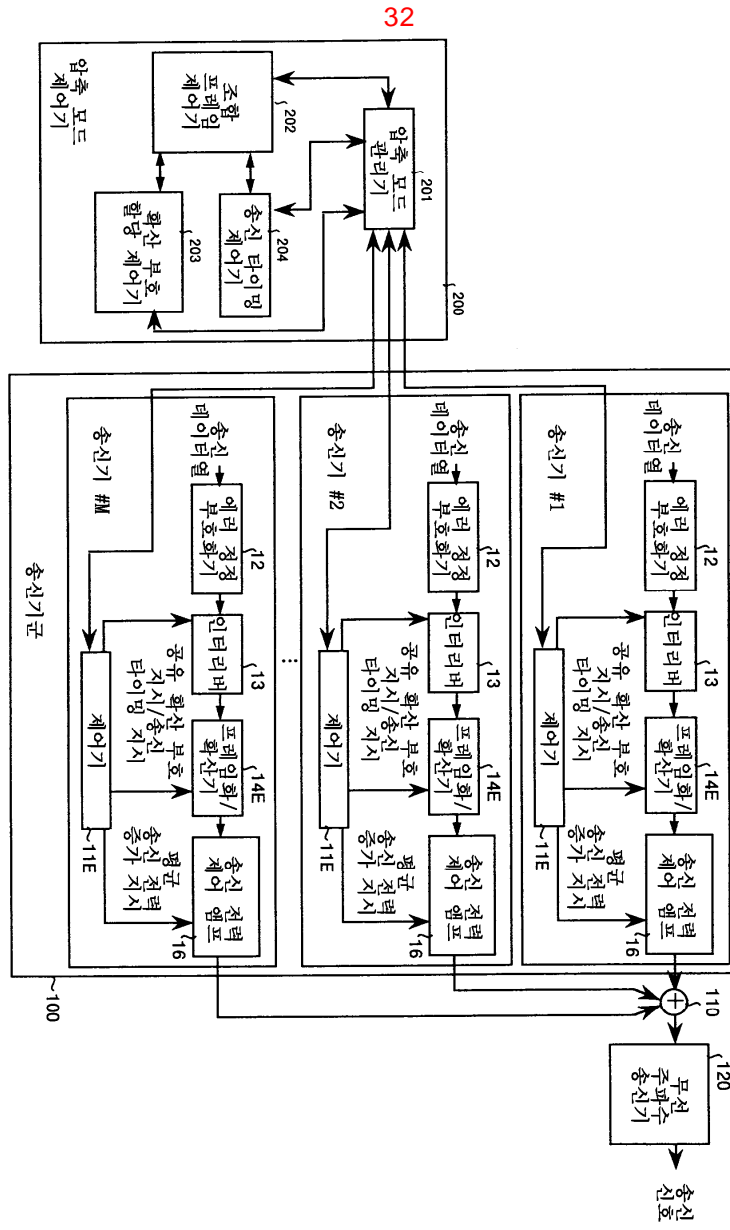
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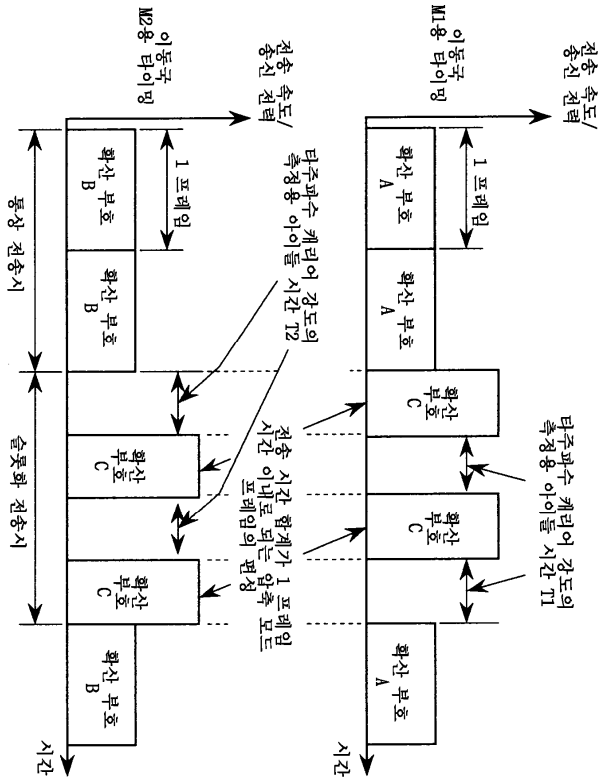
| TPC 비트 (2 비트) | 송신 전력 제어량 | |
|------------------|-----------|--------|
| | 통상 모드 | 압축 모드 |
| 11 | +1.0dB | +3.0dB |
| 10 | / | +1.0dB |
| 01 | | -1.0dB |
| 00 | -1.0dB | -3.0dB |

31

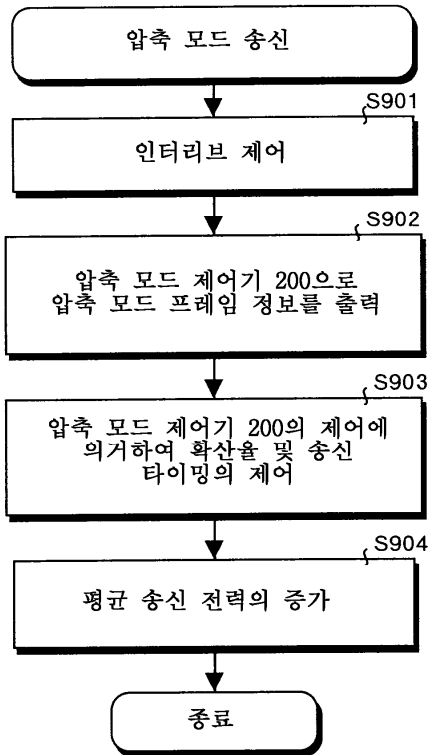




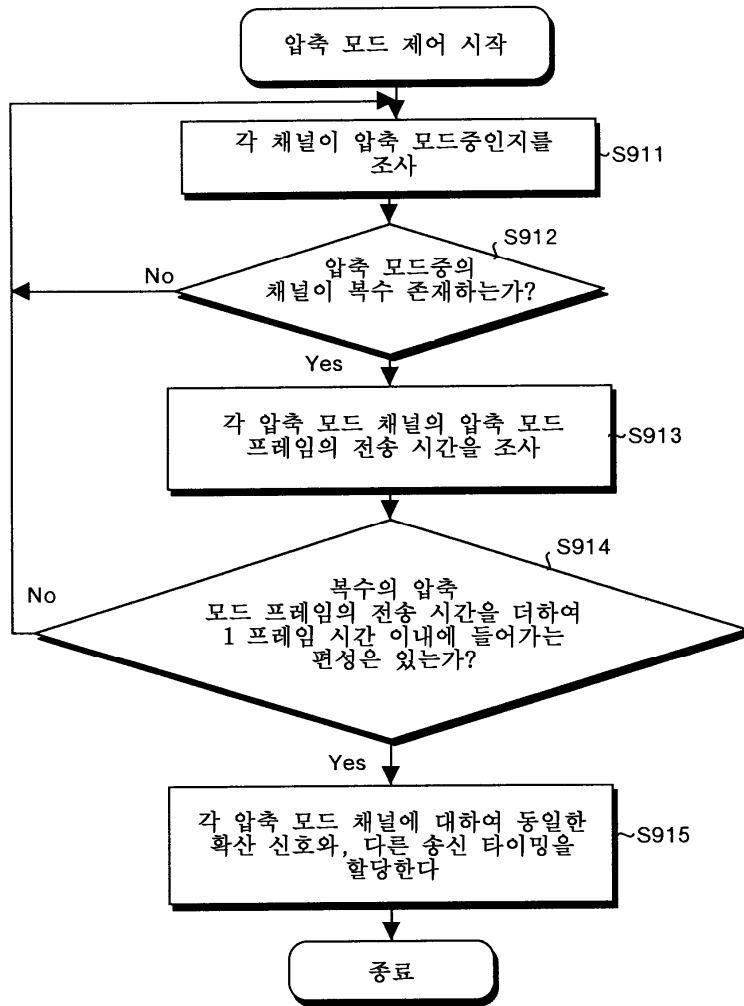
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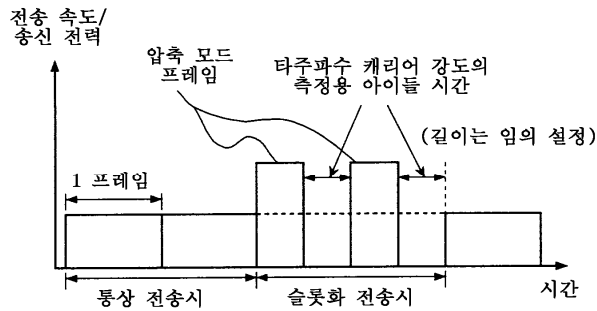
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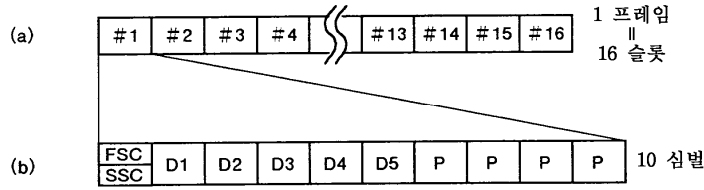


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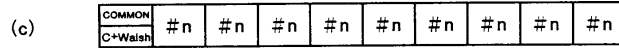


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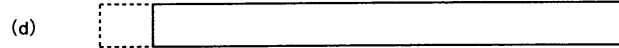
방송 채널 프레임 구성



확산 코드

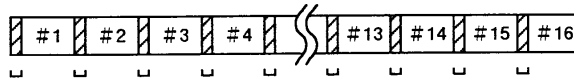


스크램블링 코드



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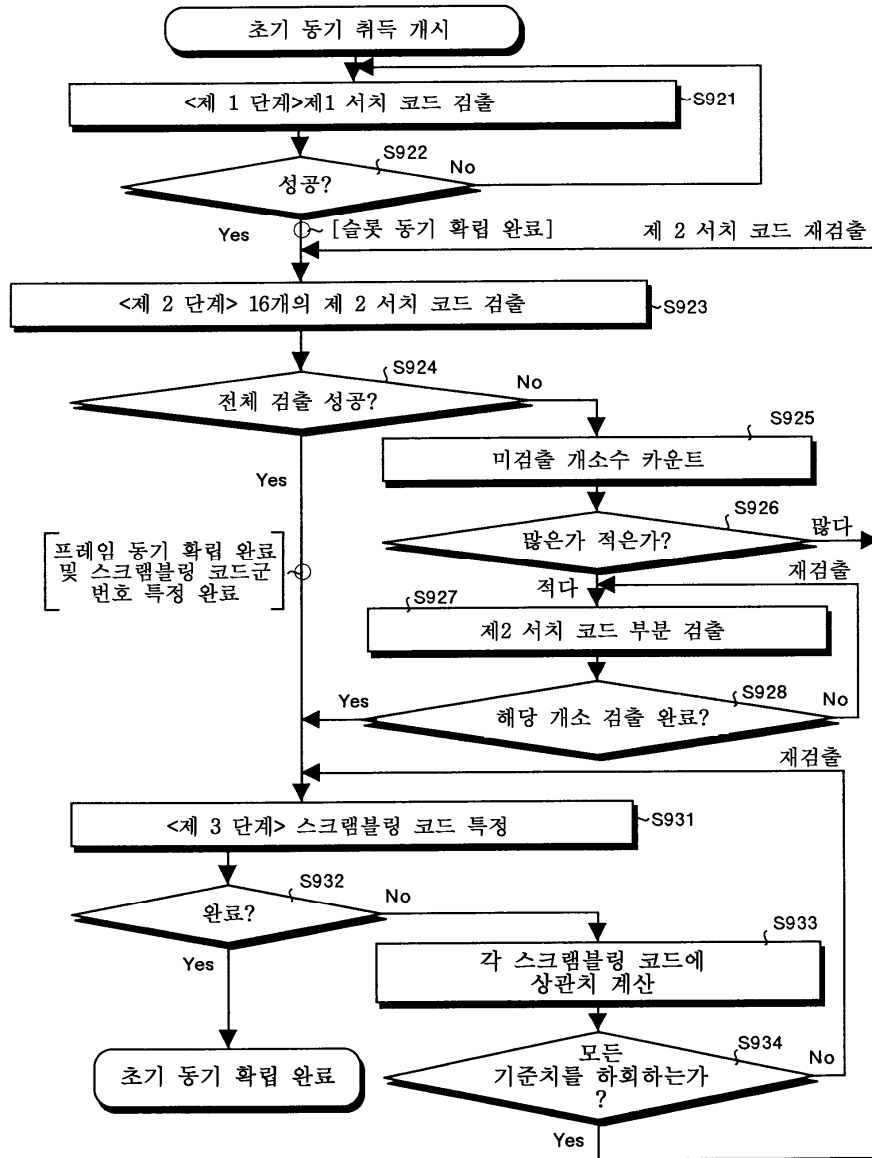
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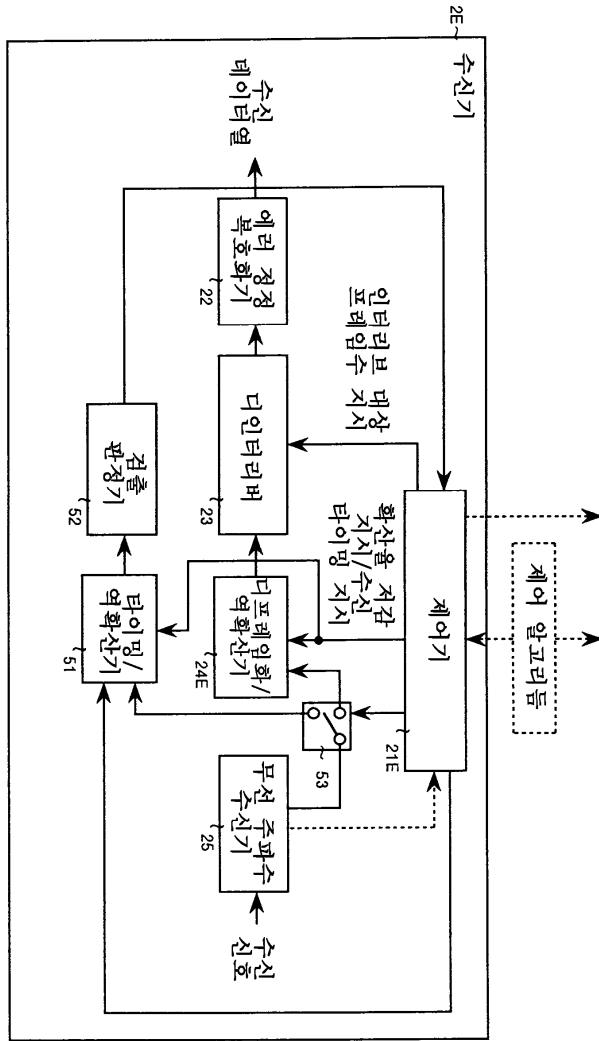
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| Slot # | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 | #10 | #11 | #12 | #13 | #14 | #15 | #16 |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| Group 1 | 1 | 1 | 2 | 11 | 6 | 3 | 15 | 7 | 8 | 8 | 7 | 15 | 3 | 6 | 11 | 2 |
| Group 2 | 1 | 2 | 9 | 3 | 10 | 11 | 13 | 13 | 11 | 10 | 3 | 9 | 2 | 1 | 16 | 16 |
| Group 3 | 1 | 3 | 16 | 12 | 14 | 2 | 11 | 2 | 14 | 12 | 16 | 3 | 1 | 13 | 4 | 13 |
| Group 4 | 1 | 4 | 6 | 4 | 1 | 10 | 9 | 8 | 17 | 14 | 12 | 14 | 17 | 8 | 9 | 10 |
| Group 5 | 1 | 5 | 13 | 13 | 5 | 1 | 7 | 14 | 3 | 16 | 8 | 8 | 16 | 3 | 14 | 7 |
| Group 6 | 1 | 6 | 3 | 5 | 9 | 9 | 5 | 3 | 6 | 1 | 4 | 2 | 15 | 15 | 2 | 4 |
| Group 7 | 1 | 7 | 10 | 14 | 13 | 17 | 3 | 9 | 9 | 3 | 17 | 13 | 14 | 10 | 7 | 1 |
| Group 8 | 1 | 8 | 17 | 6 | 17 | 8 | 1 | 15 | 12 | 5 | 13 | 7 | 13 | 5 | 12 | 15 |
| Group 9 | 1 | 9 | 7 | 15 | 4 | 16 | 16 | 4 | 15 | 7 | 9 | 1 | 12 | 17 | 17 | 12 |
| Group 10 | 1 | 10 | 14 | 7 | 8 | 7 | 14 | 10 | 1 | 9 | 5 | 12 | 11 | 12 | 5 | 9 |
| Group 11 | 1 | 11 | 4 | 16 | 12 | 15 | 12 | 16 | 4 | 11 | 1 | 6 | 10 | 7 | 10 | 6 |
| Group 12 | 1 | 12 | 11 | 8 | 16 | 6 | 10 | 5 | 7 | 13 | 14 | 17 | 9 | 2 | 15 | 3 |
| Group 13 | 1 | 13 | 1 | 17 | 3 | 14 | 8 | 11 | 10 | 15 | 10 | 11 | 8 | 14 | 3 | 17 |
| Group 14 | 1 | 14 | 8 | 9 | 7 | 5 | 6 | 17 | 13 | 17 | 6 | 5 | 7 | 9 | 8 | 14 |
| Group 15 | 1 | 15 | 15 | 1 | 11 | 13 | 4 | 6 | 16 | 2 | 2 | 16 | 6 | 4 | 13 | 11 |
| Group 16 | 1 | 16 | 5 | 10 | 15 | 4 | 2 | 12 | 2 | 4 | 15 | 10 | 5 | 16 | 1 | 8 |
| Group 17 | 1 | 17 | 12 | 2 | 2 | 12 | 17 | 1 | 5 | 6 | 11 | 4 | 4 | 11 | 6 | 5 |
| Group 18 | 2 | 8 | 11 | 15 | 14 | 1 | 4 | 10 | 10 | 4 | 1 | 14 | 15 | 11 | 8 | 2 |
| Group 19 | 2 | 9 | 1 | 7 | 1 | 9 | 2 | 16 | 13 | 6 | 14 | 8 | 14 | 6 | 13 | 16 |
| Group 20 | 2 | 10 | 8 | 16 | 5 | 17 | 17 | 5 | 16 | 8 | 10 | 2 | 13 | 1 | 1 | 13 |
| Group 21 | 2 | 11 | 15 | 8 | 9 | 8 | 15 | 11 | 2 | 10 | 6 | 13 | 12 | 13 | 6 | 10 |
| Group 22 | 2 | 12 | 5 | 17 | 13 | 16 | 13 | 17 | 5 | 12 | 2 | 7 | 11 | 8 | 11 | 7 |
| Group 23 | 2 | 13 | 12 | 9 | 17 | 7 | 11 | 6 | 8 | 14 | 15 | 1 | 10 | 3 | 16 | 4 |
| Group 24 | 2 | 14 | 2 | 1 | 4 | 15 | 9 | 12 | 11 | 16 | 11 | 12 | 9 | 15 | 4 | 1 |
| Group 25 | 2 | 15 | 9 | 10 | 8 | 6 | 7 | 1 | 14 | 1 | 7 | 6 | 8 | 10 | 9 | 15 |
| Group 26 | 2 | 16 | 16 | 2 | 12 | 14 | 5 | 7 | 17 | 3 | 3 | 17 | 7 | 5 | 14 | 12 |
| Group 27 | 2 | 17 | 6 | 11 | 16 | 5 | 3 | 13 | 3 | 5 | 16 | 11 | 6 | 17 | 2 | 9 |
| Group 28 | 2 | 1 | 13 | 3 | 3 | 13 | 1 | 2 | 6 | 7 | 12 | 5 | 5 | 12 | 7 | 6 |
| Group 29 | 2 | 2 | 3 | 12 | 7 | 4 | 16 | 8 | 9 | 9 | 8 | 16 | 4 | 7 | 12 | 3 |
| Group 30 | 2 | 3 | 10 | 4 | 11 | 12 | 14 | 14 | 12 | 11 | 4 | 10 | 3 | 2 | 17 | 17 |
| Group 31 | 2 | 4 | 17 | 13 | 15 | 3 | 12 | 3 | 15 | 13 | 17 | 4 | 2 | 14 | 5 | 14 |
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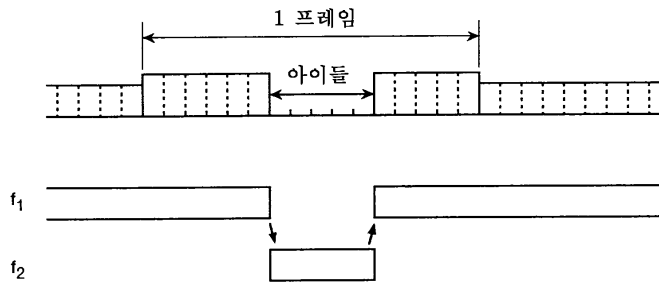
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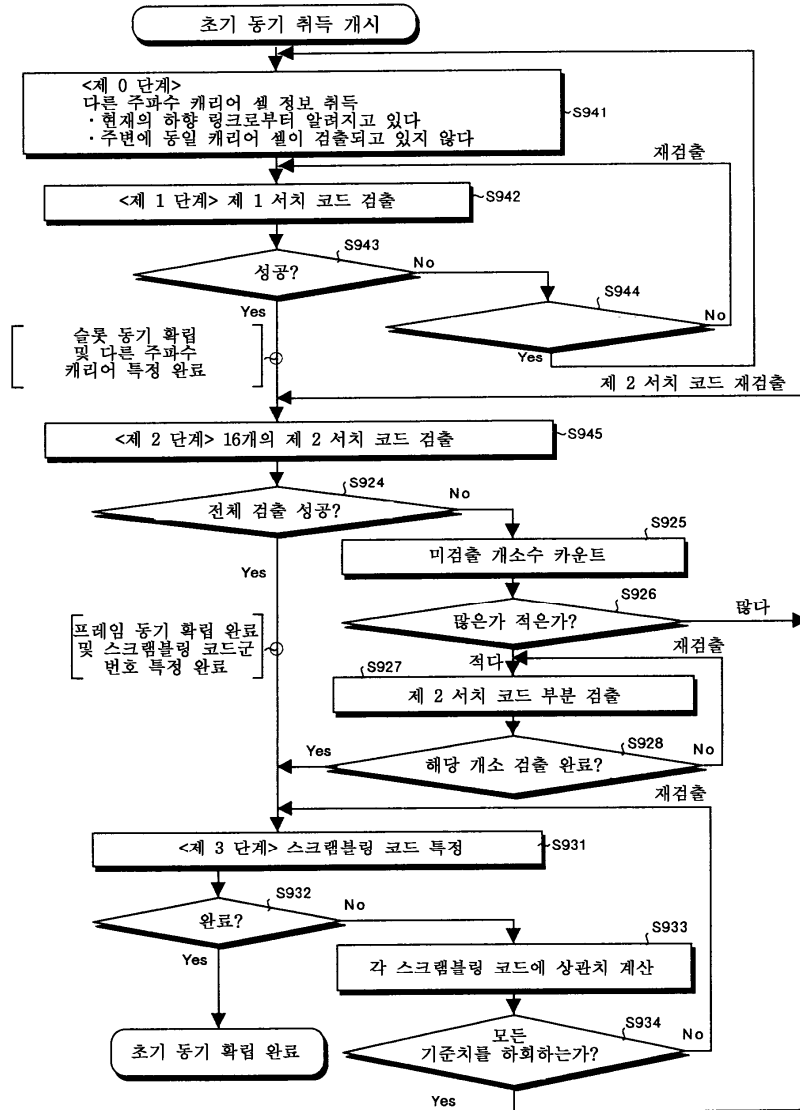
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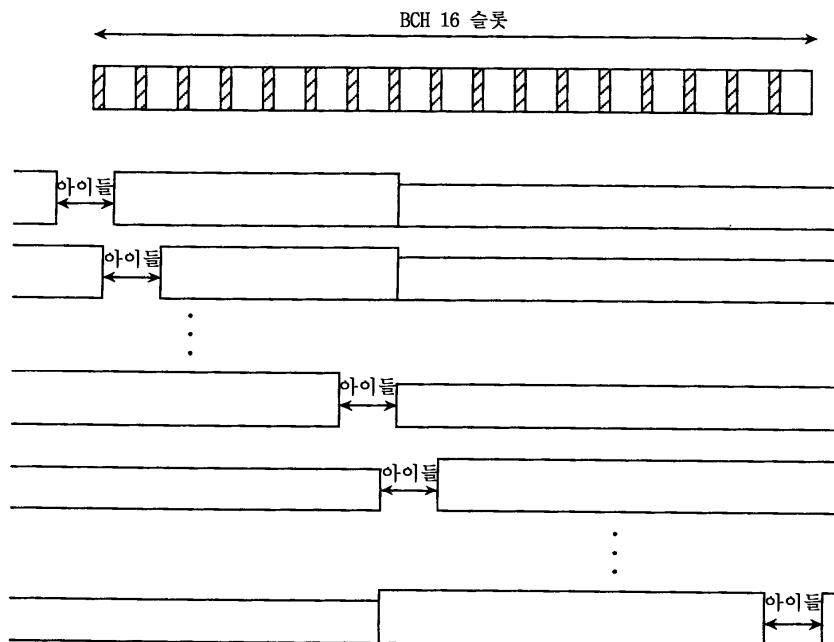
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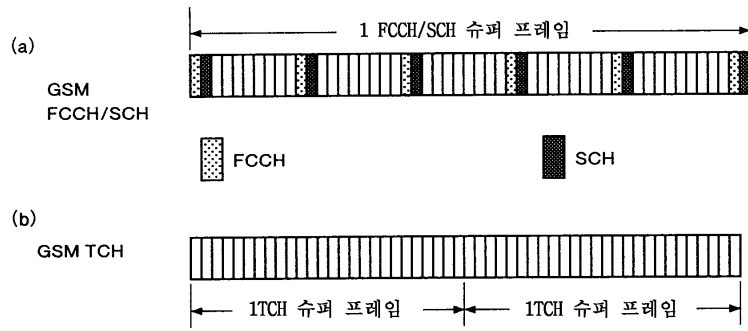
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