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(43)2002 - 0079140
2002 10 19(21) 10 - 2001 - 0019848
(22) 2001 04 13

(71) 114

(72) 19 808

6 - 3 105 1403

(74)

:

(54) 2 3

2

가 , 3 .

3

1

2

3

2

3

4 4 × 4 가 .

5 1 (e1) .

6 .

7 .

8 가 .

9a 2 .

9b 2 .

9c 4 .

10 .

11 , .

12 11 (110) .

13 가 .

14 가 .

15 .

< >

1 :

5 :

11 :

21 :

31 :

37 :

3 - D

2 - D

(array transducer), (probe)

2 2 가

1 3 2 가 2

2 가 3 , TGC , A/D , 2 가 64 가 64 , 3

60% " (sparse array)" 가 , 가

2 3

2 , 가

2 (annular) (arc) ()

2

1 2 . 1 2
가

1a 1c (steering) , 1a - c (,)

2a - 2c . 1d (P) 1d
2d 64 × 64 . 2d
가

P ,

3 (11) (bipolar pulse)
(1) 2 (transducer)가

(TX focus delay memory)(14)
(11)
가 , 가 (

1) , 가 ,
(synthetic aperture)

(1) 2 . 2
(11) .
64 × 64 가
(aperture) 32 × 32 .

(5)
(5)가 , (5)

(5) 가
(1) (21) 가
(21)
4 4 × 4
4
가 ,
(sparse transduc

er group) 가 , 가 .

3 (21) (11) (duplexer)
 . , 가 가 ,
 . 11 (1)
 (21) .

(31) , (Pre - Amplifier), 가
 TGC(Time Gain Compression,) ADC(analog - digital converter, -
) , .

(37) (36)
 (37) 1 2 .
 $C \times 1$ 2
 1 가 , C () . ,
 (37) 1 가 .

() 가 , 가
 (31)
 , (5)
 (,)
 가 가 ()
 가 .

(41) (envelope detection), (log compression) ,
 3 3 B
 , , (tissue characterization) 가 .

3
 가 , 가 LUT(Lookup Table)
 가 . 가 ,
 가 .

$N \times N \times CN$ $N \times N$ CN $N \times N$,
 64×64 가 64
 $64 \times 64 \times 64 = 262,144$ 가
 가 , 가
 가 4 CN
 , 64 가 .

가 CM 가 CM 가 $\frac{M \times M}{M}$ CN(64) $\times$
 $(\frac{1}{N} + \frac{1}{64} \frac{M}{8}) \times CM \times N \times N + CM \times CN \times N \times N / (M \times M) = 65536$ 25%
 .

2 , 가

$\frac{64 \times 64 (N \times N)}{16 \times 16 (M \times M)}$, $\frac{20 (CM)}{16 \times 20}$
 , $\frac{1}{2} \frac{CM \times 64 \times 64}{(16 \times 16)}$ [$CM \times CN \times (64 \times 64) / (16 \times 16)$]
 , 가

가

가
 trasonic Transducer) , AMA(active mirror array) CMUT(Capacitor Micromachined UI
 60 $M \times N$ $M \times N$ 5,682,2
 (active matrix array) 가 가
 (V_{pp}) 가

IC () 40 가
 (30%) ,
 가
 가 (+20, -20)
 가 2

(coded pulse excitation)

가

onent)

(flexible) PCB

(discrete comp
가

가 , IC
BGA(Ball Grid Array)
BGA

(die)

(Flip Chip Packaging: FCP)

(Chip on Film: COF)

5 1 (e2) (I) (F) 가 (e1) , (e2) (I)가 (e1)
가

, (F) I가 , 가
(1a),

가
가

2 가 . 64 × 64 , 4096 (32)
4096 × 2 = 8192

(, 3 (5)

1 . 2 1
3

transient response)

가 (ADC
(5Vpp) 가

RF
ADC

& , 가

N

N

N

()

(aperture)

6

2

6

1

6

가

가

(

)

가

가 7

7

가

8

가

가

가 가

가 , 8

가

가

,

가

가

11

,

3

,

가

erture)

9a

9b

가

가

,

2

9b

(ap

가

9b

. 3

, 4

. (9C)

10a

가

가

(time - multiplexing swi

tch)

가

10a

10b

3

가

가

가

10c

10d

가

3

(21)

가

11

12

(21)

(Tr1, Tr2)

Tr1

Tr2

Tr2가

가

+20

-20

(Tr3)가

(Tr3)가

가

(110)

12

(110)

가

(120)

12

2

(

2

2

가

3D

가

1

13 가 s0 e2 s0 e2, s1 e3, 가
 . s0 e2 s2 e0 .
 , LUT LUT
 , s2 e1 e3

H/W . 2

가 (13).

13 14

가 , 1/4 , s0, s4, s8, .

0 , s1, s5, s9, . 1 , s2, s6, s10, . 2 , s3, s7, s11, . 3

LUT

(convex, concave)

가 , 가 , 가 .
가 가 , , ,
가 .
가 , .

가

15 2 .

15a 2 가 가 (sphere) 3 ,
 가 15a 2 가 (sphere) ,
 R 2 a, b ()
 ()
 가 15a S 2 가 R
 15a .

15b 15a 15c 15a 15b a b
 (volume angle) 2 a, b , 가
 15d 15a S 2
 (a) (b)
 (active) N', M' (N> =N',
 N, M , d, h
 M> =M'). 가 ,
 15 2 (steering))가
 2 (,
 , 1 가
 (0.5 λ) , 2 λ
 가 SNR
 2 (act
 ive channel, active transducers)
 가
 2 가 , x y
 64 (, 4096) 2
 256 , x, y 16 16x16 (15d).
 2 (X × Y)
 , X × Y 가
 가
 15e 1 2 4
 가
 가 가 , 15e
 가
 가 ,
 가

2

3

가 .

2

2

가 ,

가 .

(57)

1.

,

2

,

.

2.

1

,

.

3.

2

,

.

4.

1

,

가 IC

.

5.

1

,

가 IC

.

6.

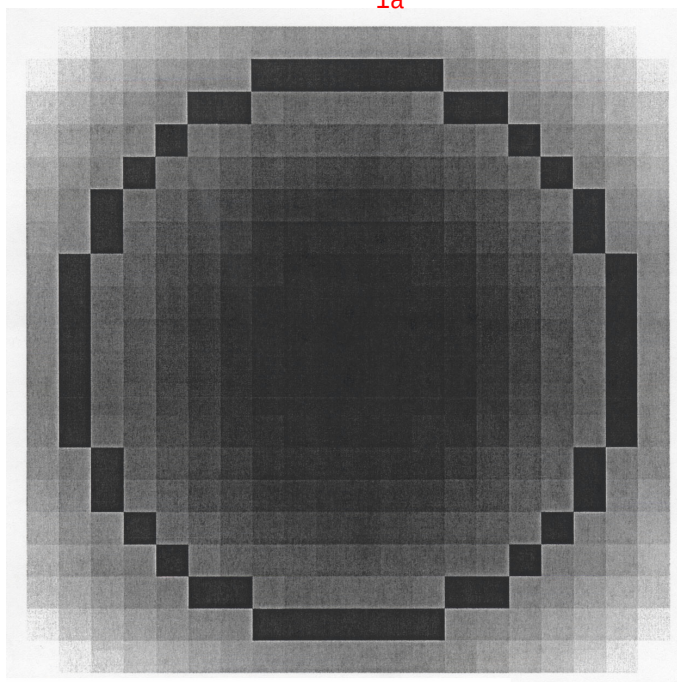
3

,

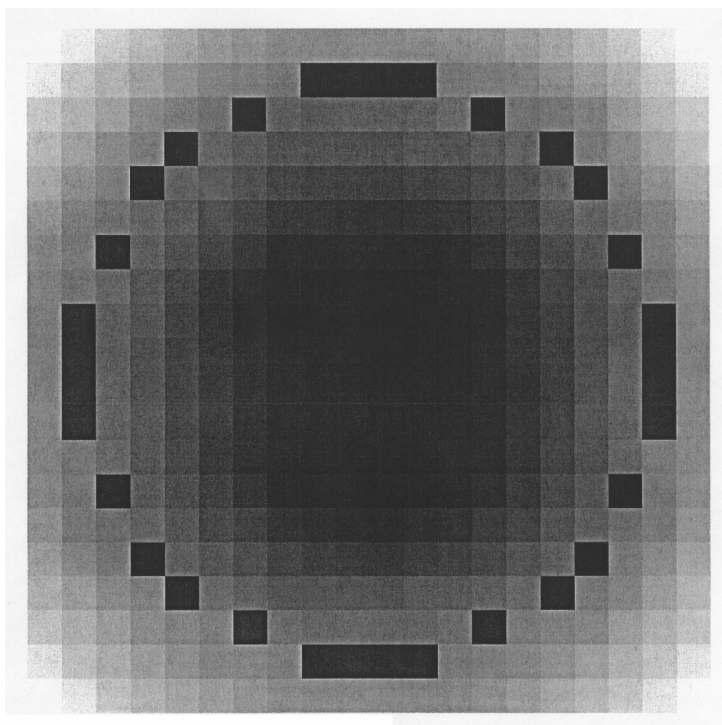
,

.

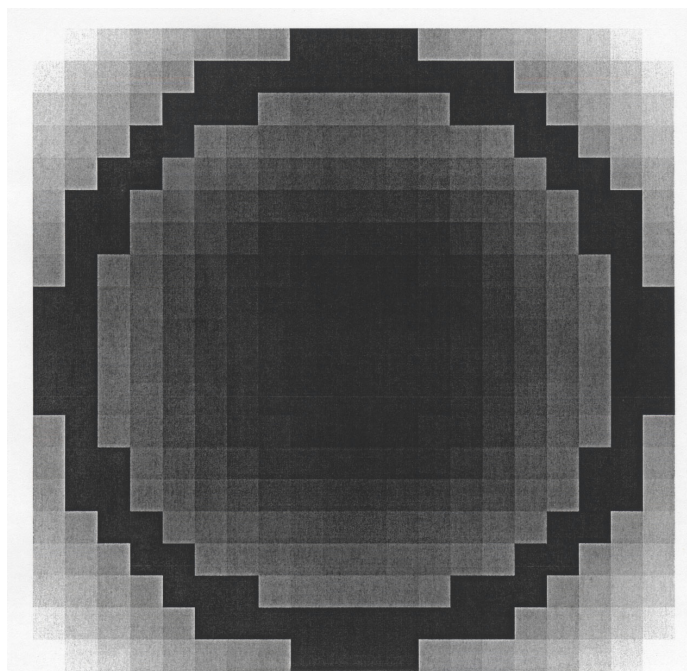
1a



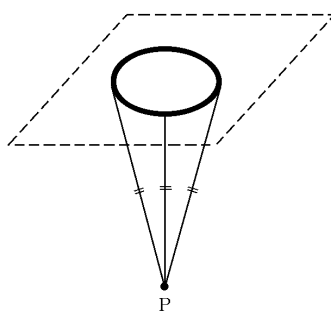
1b



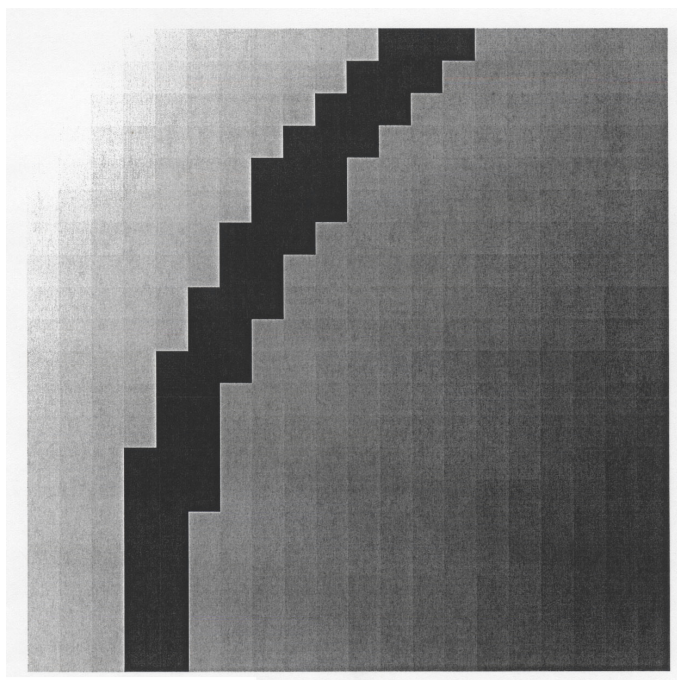
1c



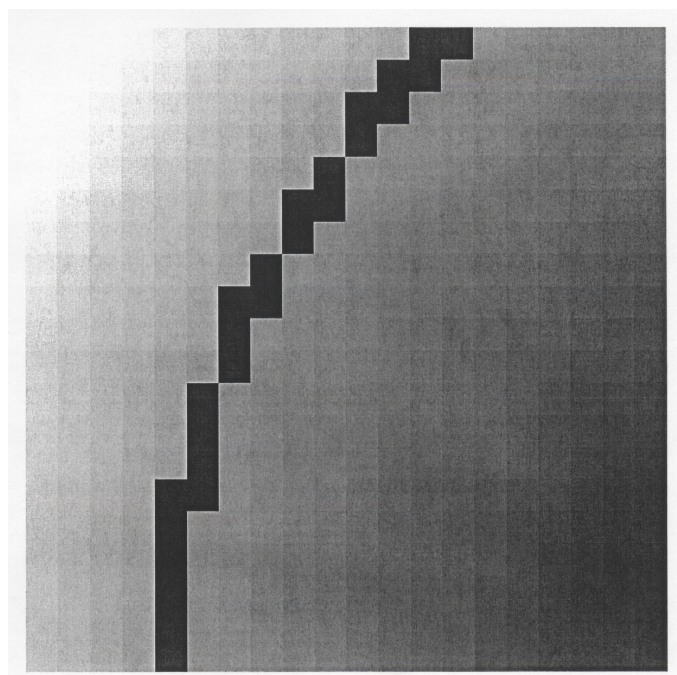
1d



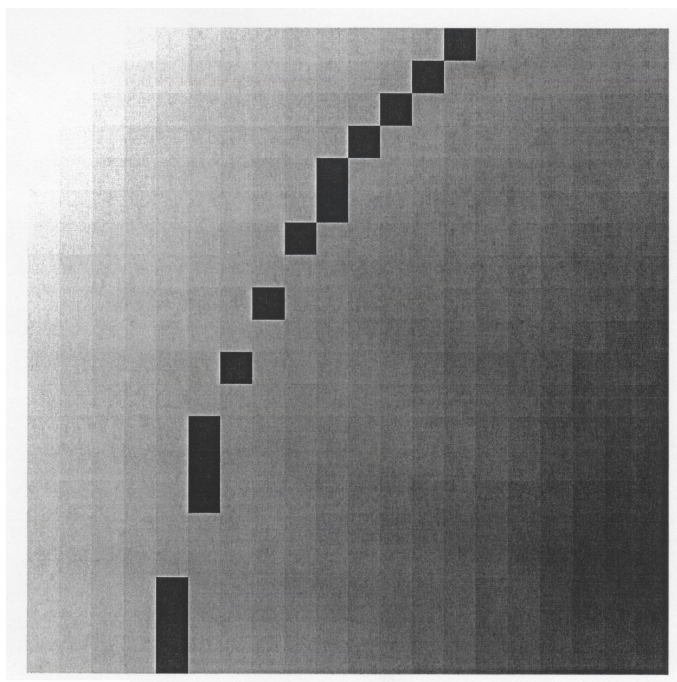
2a



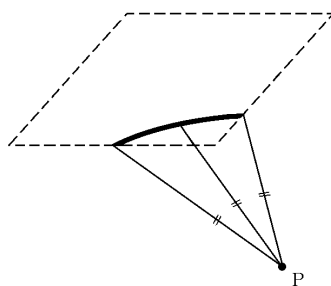
2b



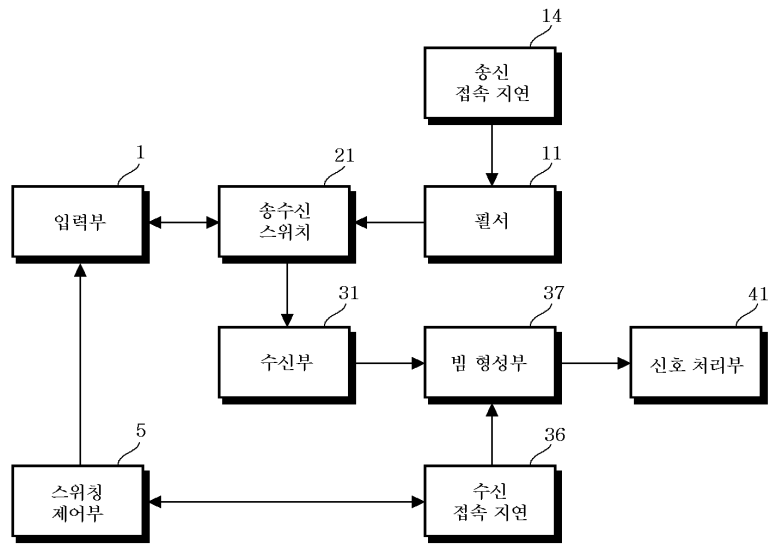
2c



2d



3



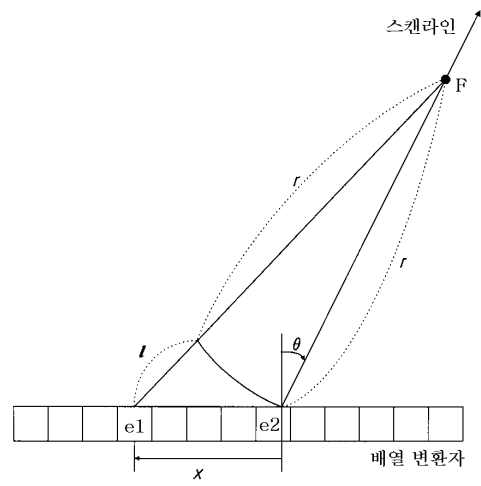
4

1	2	3	4
2	2	3	4
3	3	4	5
4	4	5	5

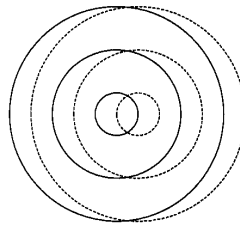
3	2	2	3
2	1	1	2
2	1	1	2
3	2	2	3

1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7

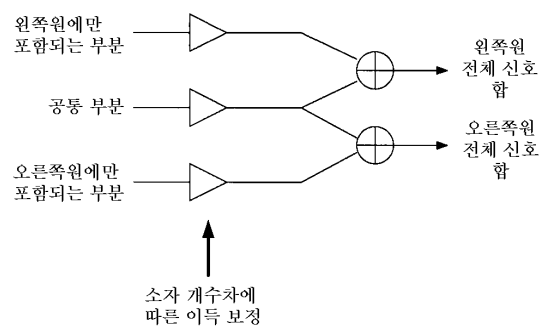
5



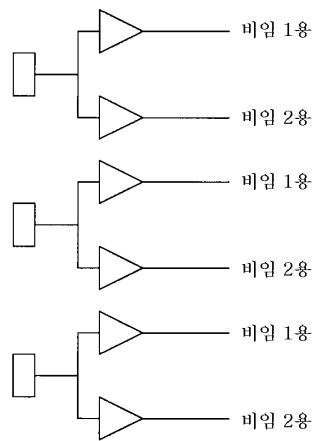
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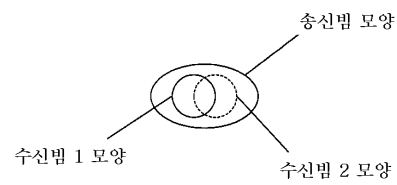
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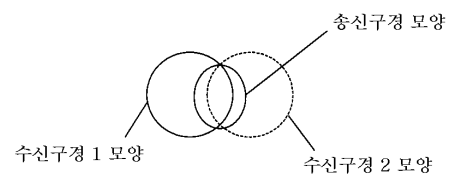
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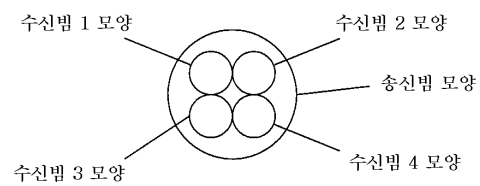
9a



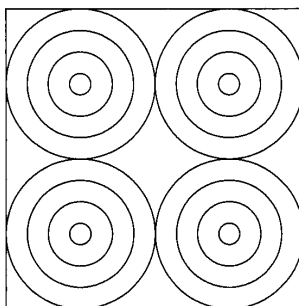
9b



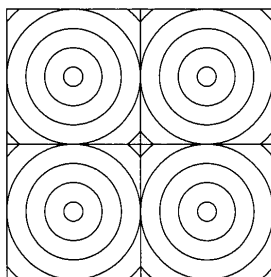
9c



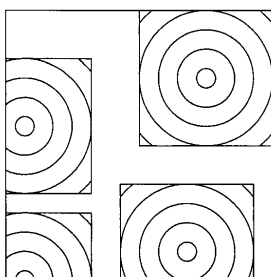
10a



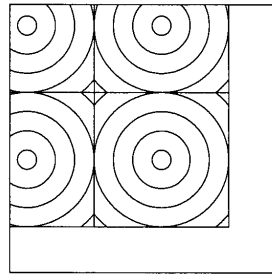
10b



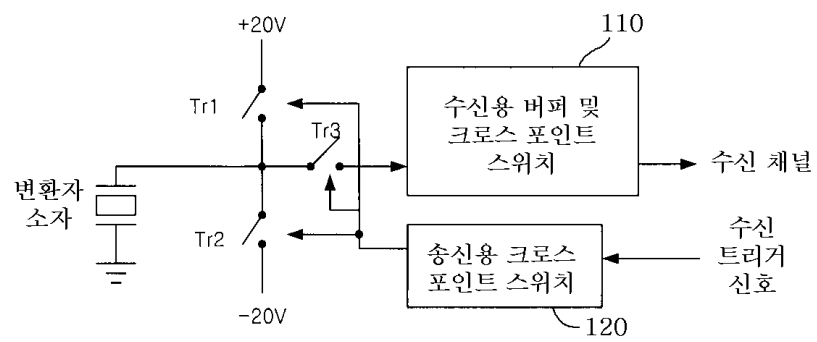
10c



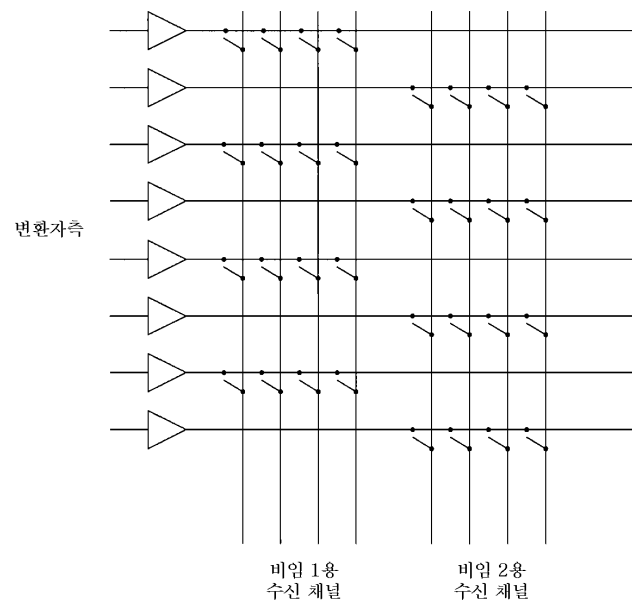
10d



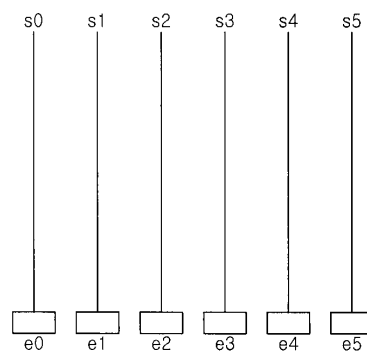
11



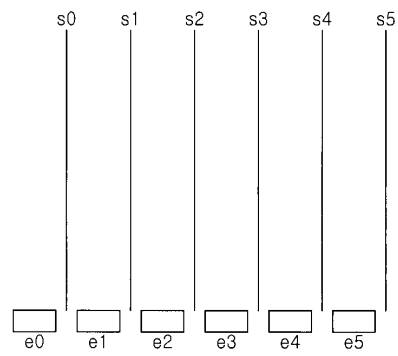
12



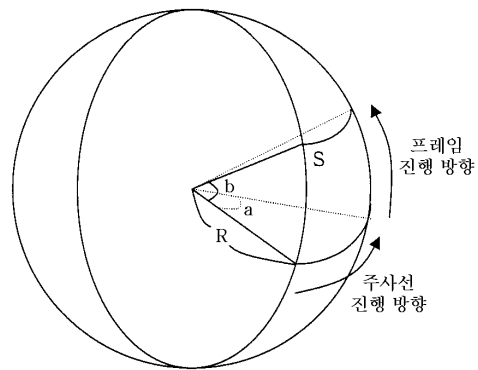
13



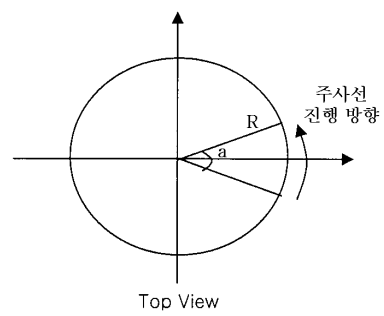
14



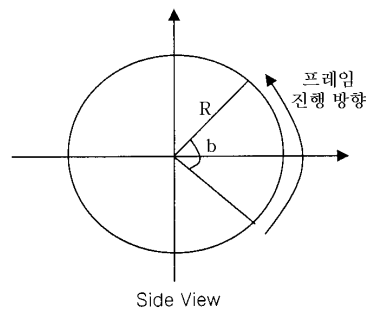
15a



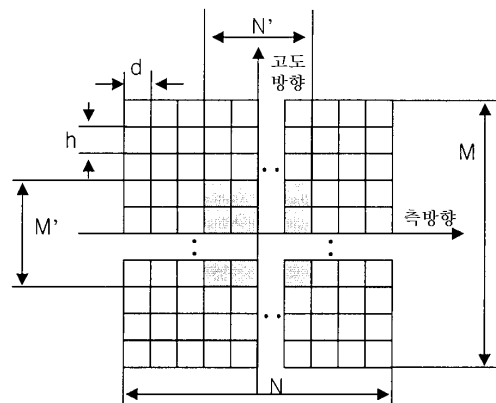
15b



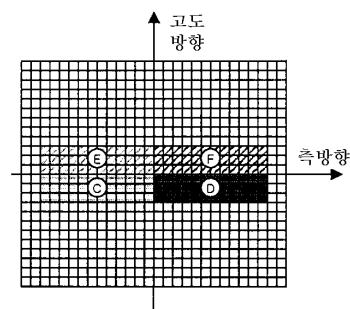
15c



15d



15e



专利名称(译)	采用转换器分组开关的二维阵列变换器聚焦装置和三维超声成像系统		
公开(公告)号	KR1020020079140A	公开(公告)日	2002-10-19
申请号	KR1020010019848	申请日	2001-04-13
[标]申请(专利权)人(译)	三星麦迪森株式会社		
申请(专利权)人(译)	三星麦迪逊有限公司		
当前申请(专利权)人(译)	三星麦迪逊有限公司		
[标]发明人	BAE MOOHO 배무호 SONG TAIKYONG 송태경		
发明人	배무호 송태경		
IPC分类号	A61B8/00		
CPC分类号	A61B8/4483 G01N2291/106 G01S15/8925 G01S15/8993		
代理人(译)	CHU,晟敏 CHANG, SOO KIL		
其他公开文献	KR100816825B1		
外部链接	Espacenet		

摘要(译)

二维阵列变换器技术领域本发明涉及一种用于超声波图像形成装置的二维阵列变换器。两个或更多个换能器通过连接到换能器的多个开关元件短路以形成换能器组，其中换能器组彼此短路包括与给定焦点基本相同距离的换能器。通过对变换器进行分组，减少了要处理的信道的总数，因此，减少了要处理的计算量，从而可以实现3D超声图像形成。 3

