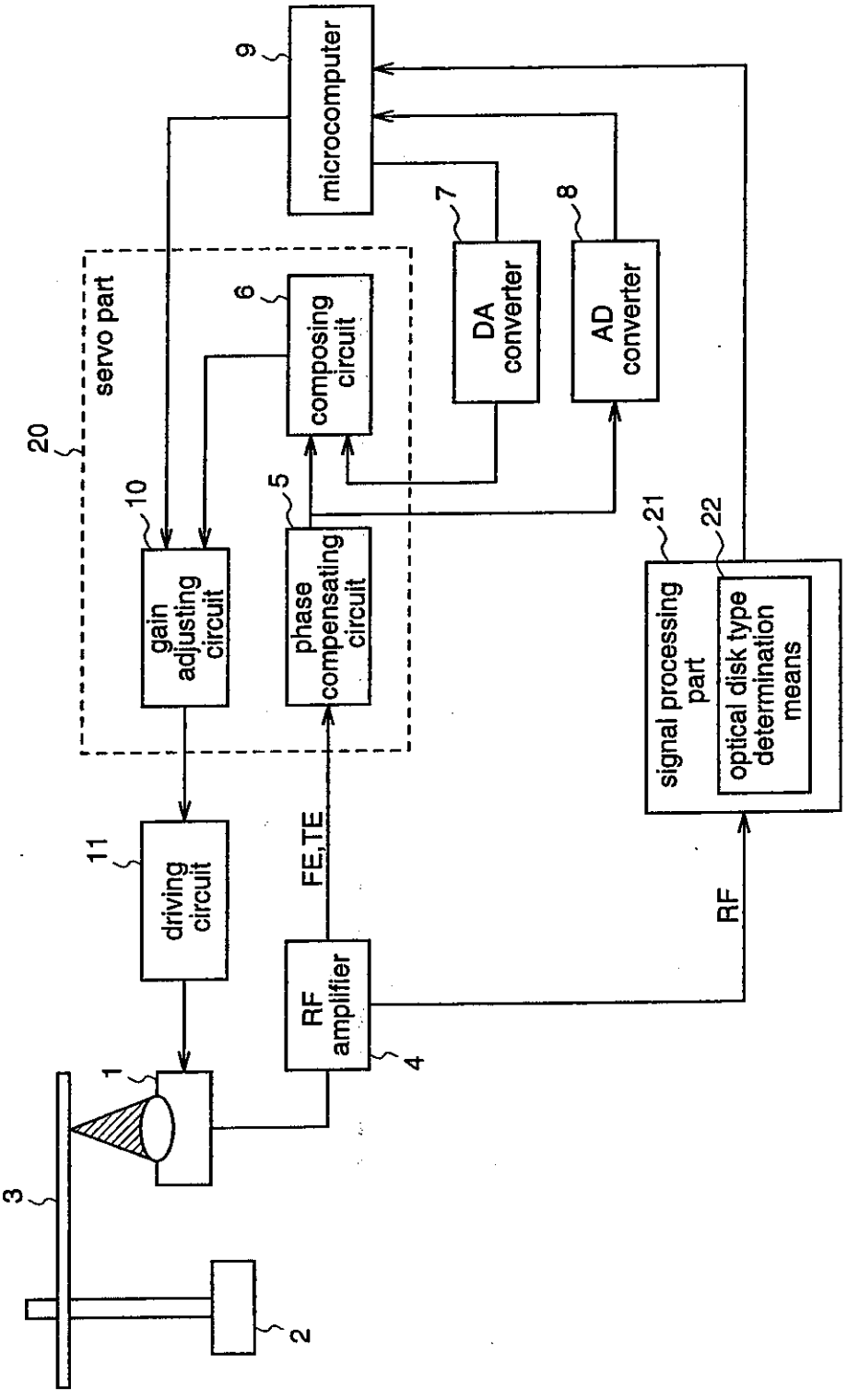

microcomputer
9
DA converter
7
AD converter
8
servo part
20
composing circuit
6
gain adjusting circuit
10
phase compensating circuit
5
signal processing part
21
optical disk type determination means
22
driving circuit
11
FE,TE
RF amplifier
4
RF
1
3
2

Fig.1

Fig.2

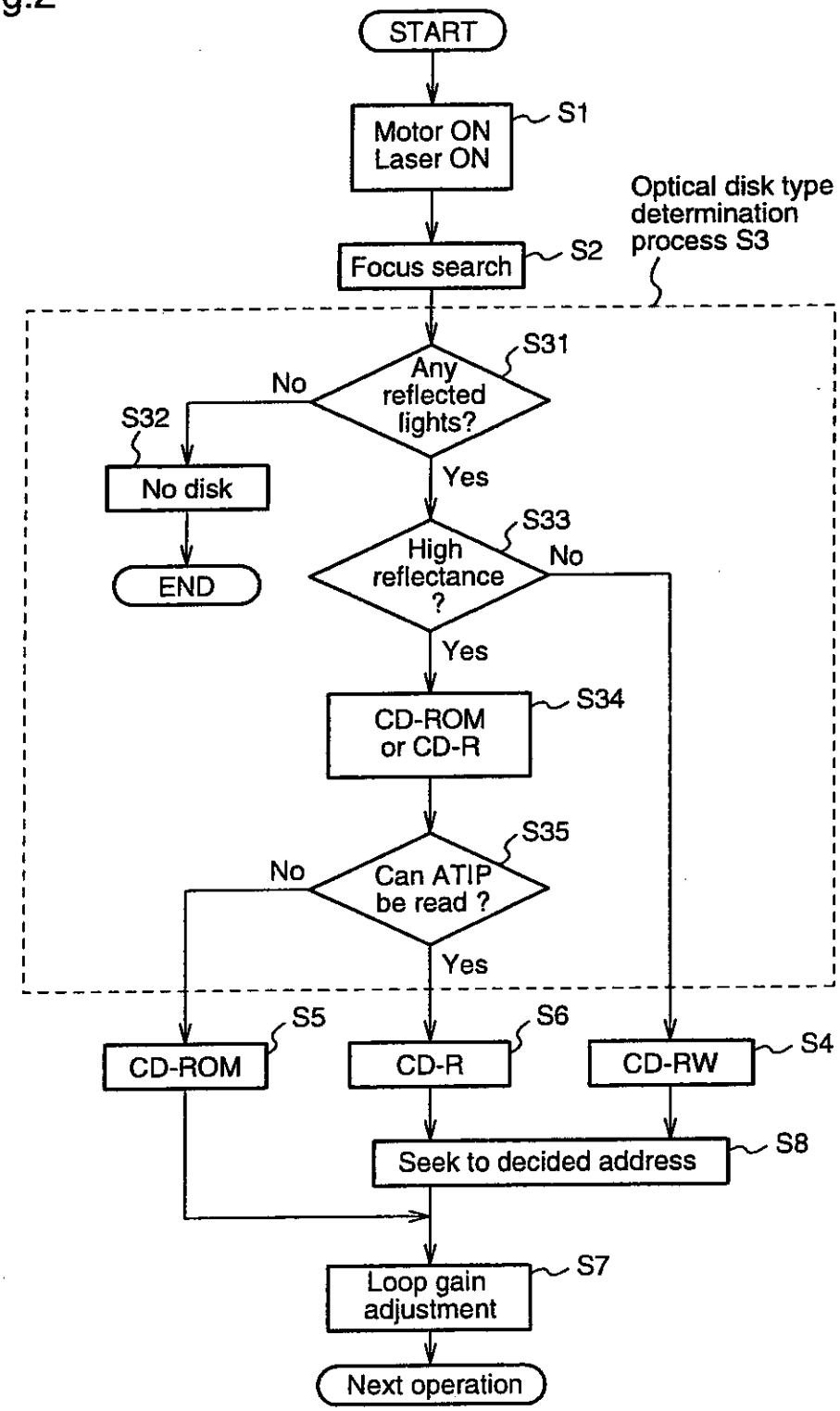
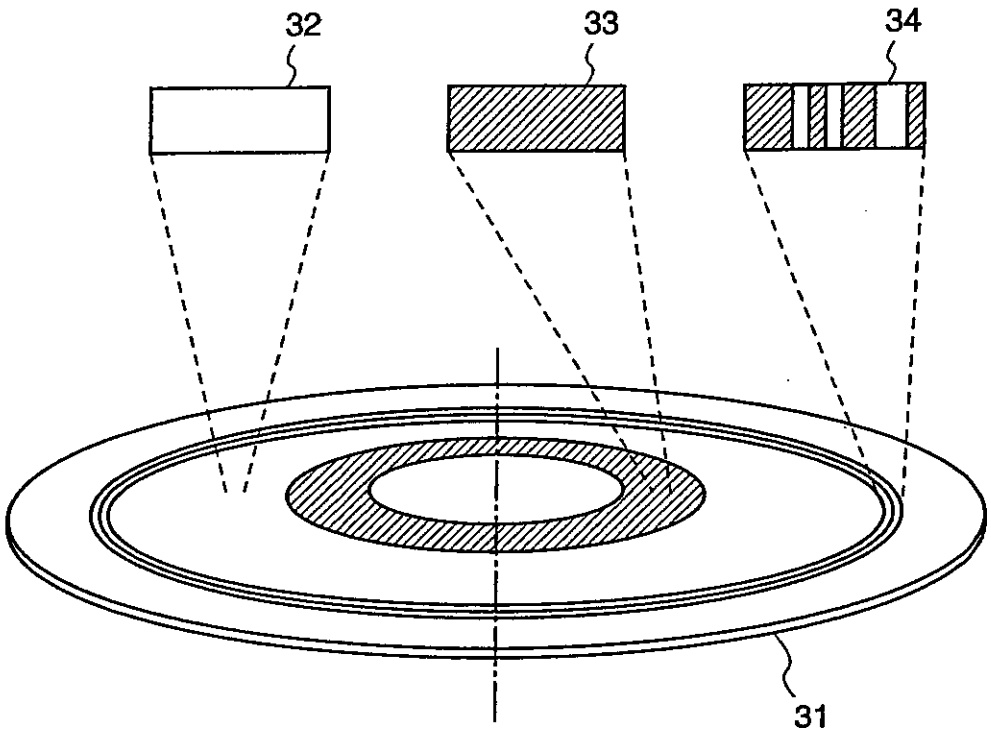

START
Motor ON
Laser ON
S1
Optical disk type determination process S3
Focus search
S2
S31
Any reflected lights?
No
S32
No disk
END
Yes
S33
High reflectance ?
No
Yes
CD-ROM or CD-R
S34
S35
Can ATIP be read ?
No
Yes
CD-ROM
S5
CD-R
S6
CD-RW
S4
Seek to decided address
S8
Loop gain adjustment
S7
Next operation

Fig.3



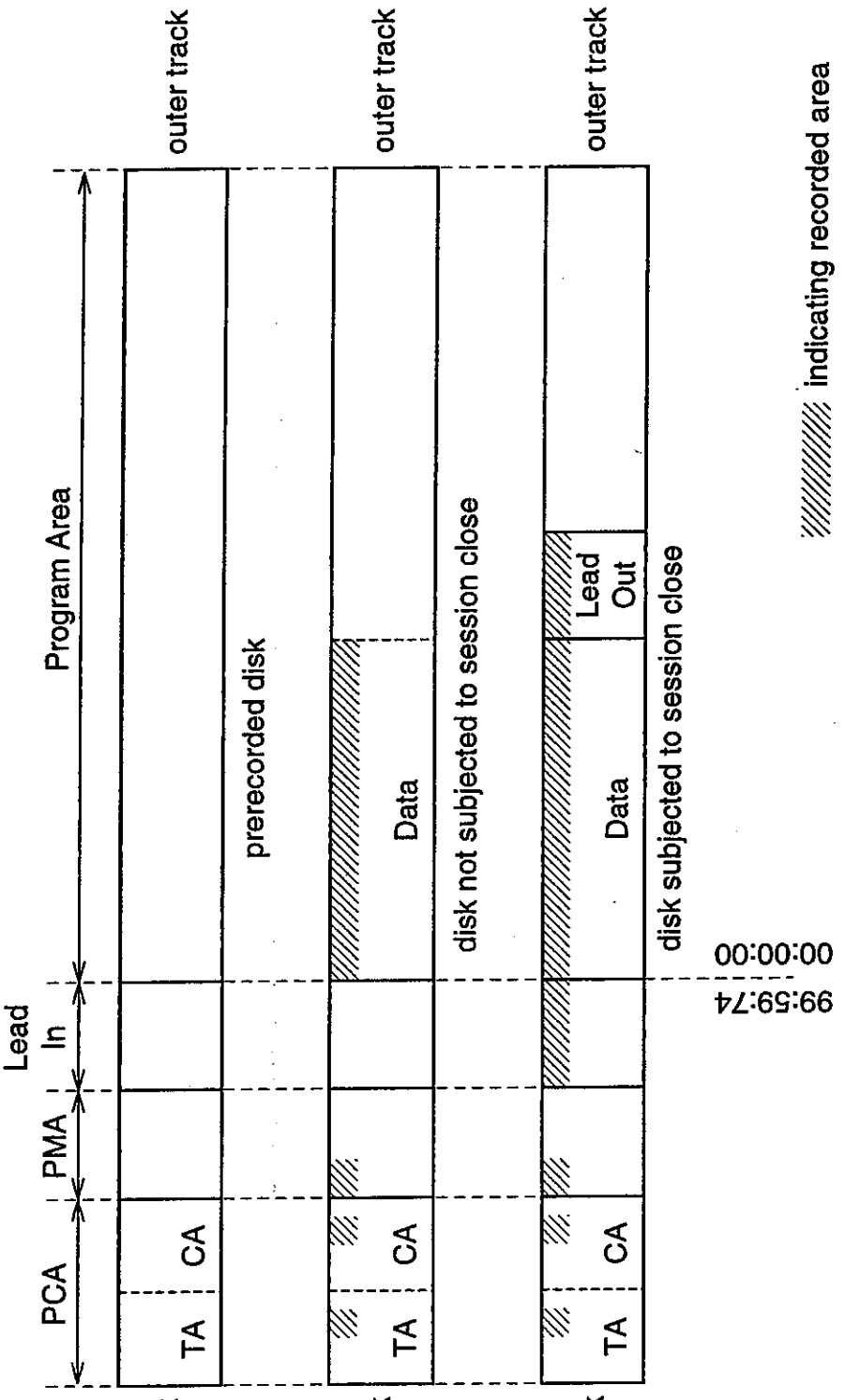



Fig.4(a)

Fig.4(b)

Fig.4(c)

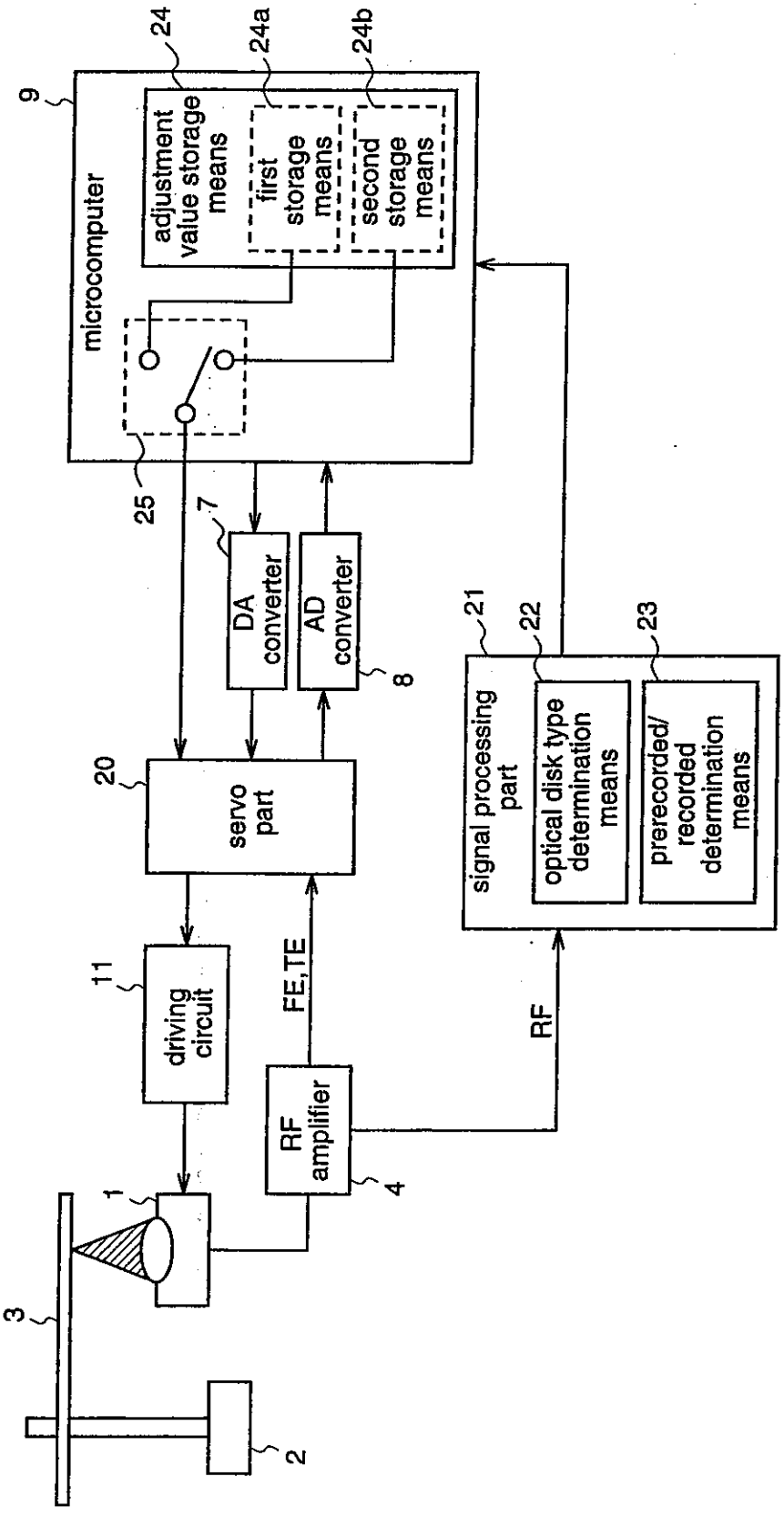

9
microcomputer
24
adjustment value storage means
24a
first storage means
24b
second storage means
25
7
DA converter
AD converter
8
20
servo part
11
driving circuit
FE,TE
RF amplifier
4
1
3
2
RF
21
signal processing part
22
optical disk type determination means
23
prerecorded/ recorded determination means

Fig.5

Fig.6

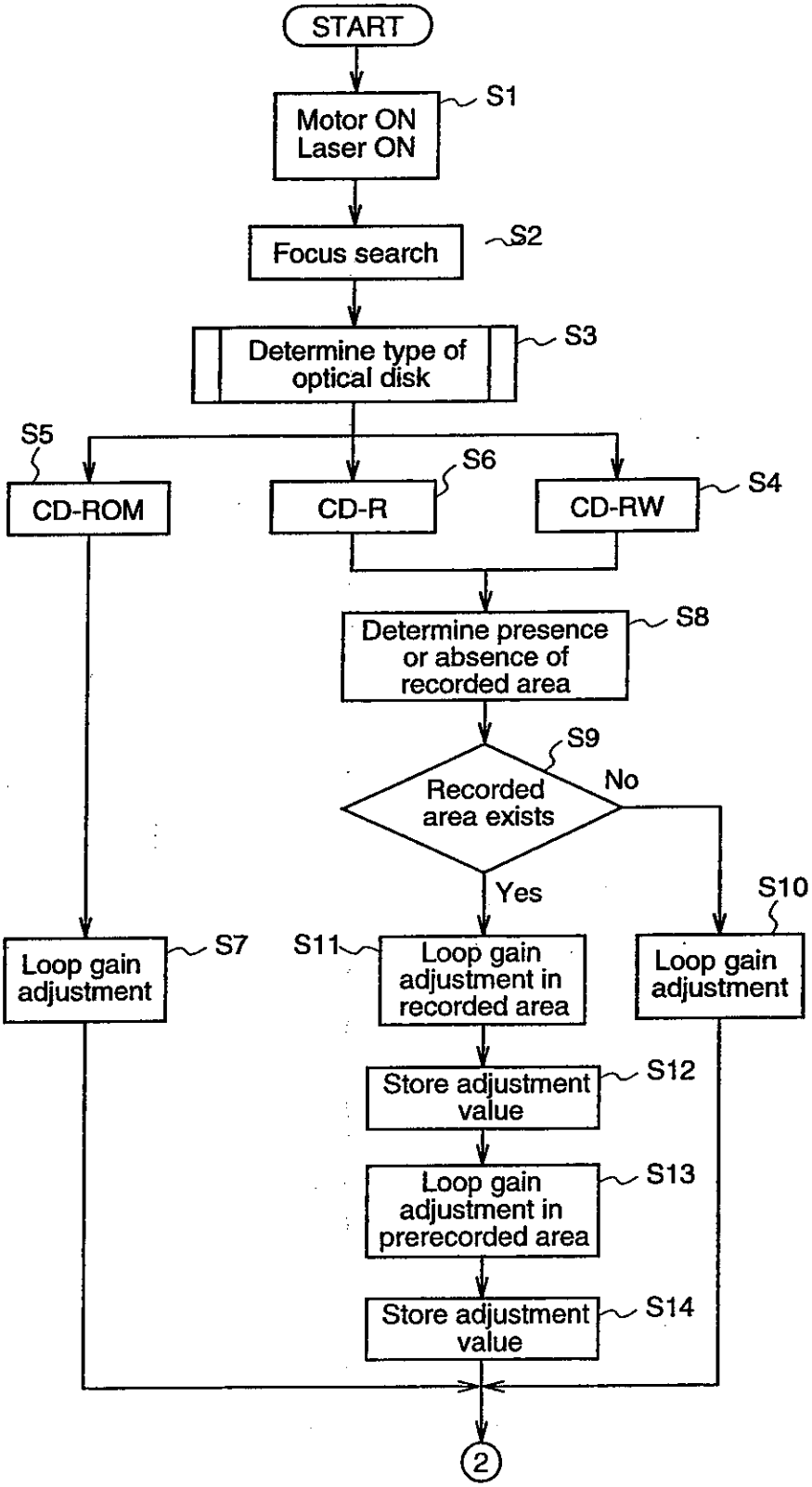

START
Motor ON
Laser ON
S1
Focus search
S2
Determine type of optical disk
S3
S5
CD-ROM
S6
CD-R
CD-RW
S4
Determine presence or absence of recorded area
S8
S9
Recorded area exists
No
Yes
S10
Loop gain adjustment
S7
S11
Loop gain adjustment in recorded area
Loop gain adjustment
Store adjustment value
S12
Loop gain adjustment in prerecorded area
S13
Store adjustment value
S14
2

Fig.7

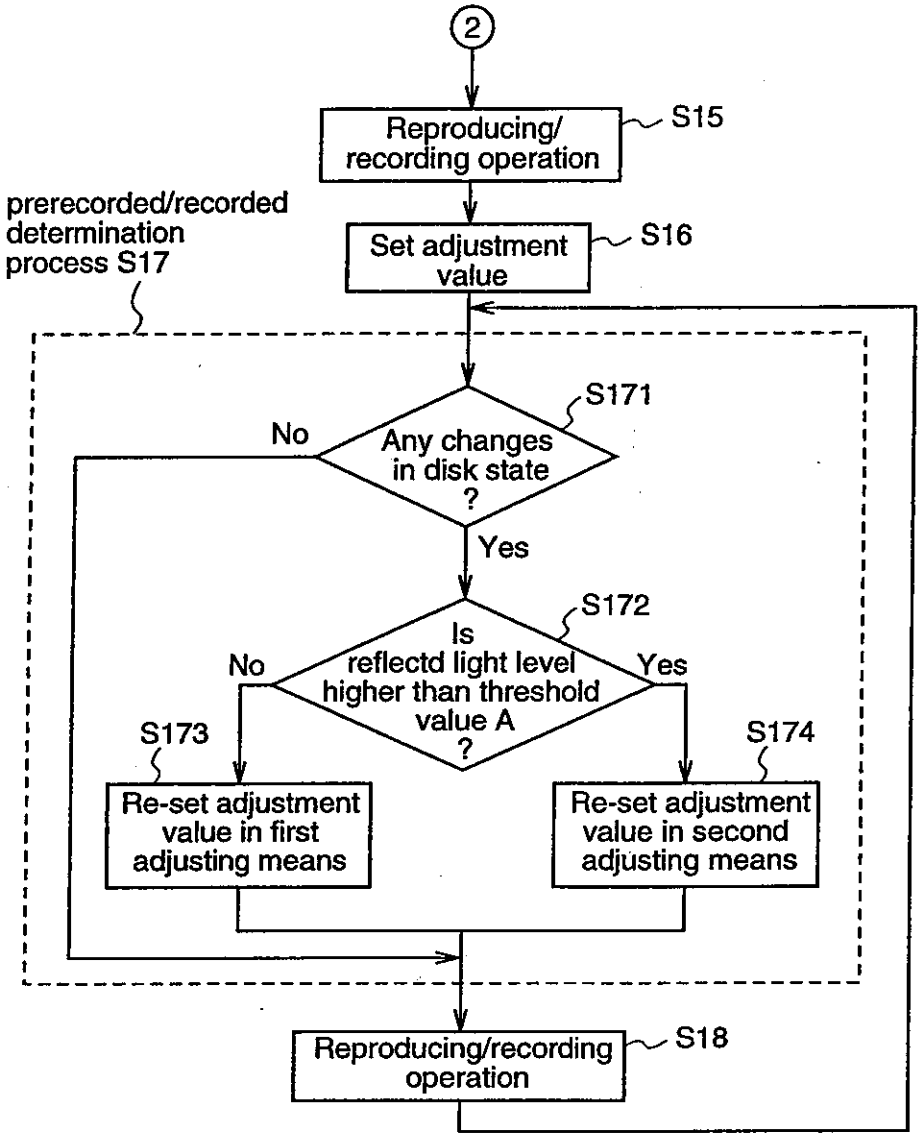

2
Reproducing/ recording operation
S15
prerecorded/recorded determination process S17
Set adjustment value
S16
S171
No
Any changes in disk state ?
Yes
S172
Is reflectd light level higher than threshold value A ?
No
Yes
S173
S174
Re-set adjustment value in first adjusting means
Re-set adjustment value in second adjusting means
Reproducing/recording operation
S18

Fig.8

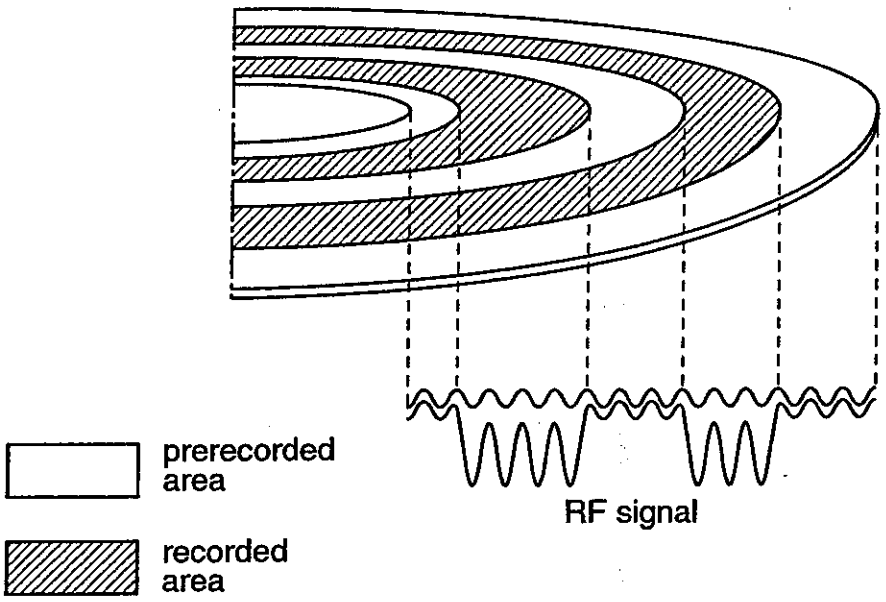

prerecorded area
recorded area
RF signal

Fig.9

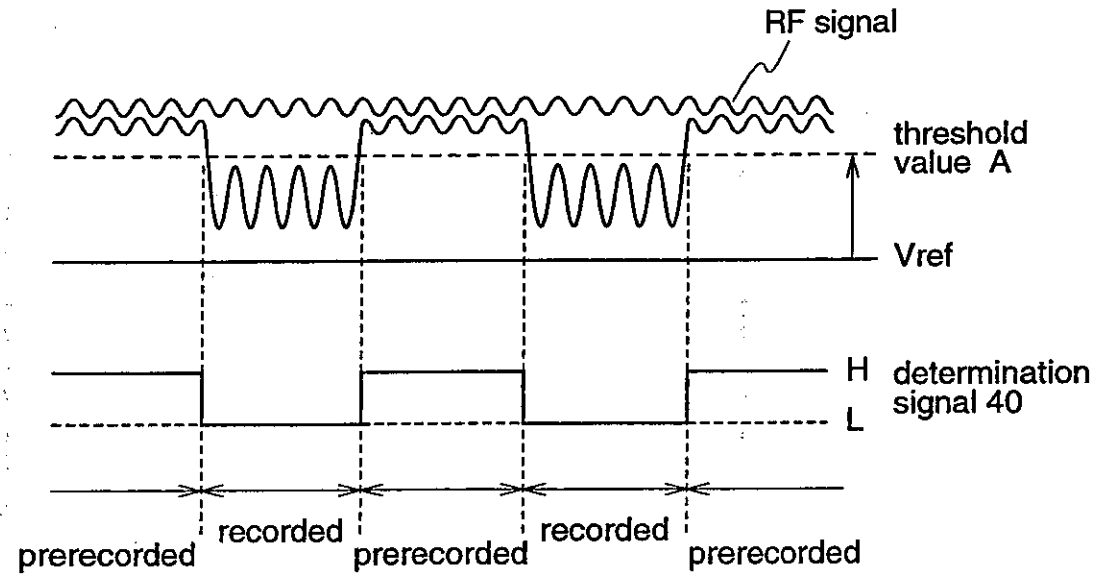

RF signal
threshold value A
Vref
H
L
determination signal 40
prerecorded
recorded
prerecorded
recorded
prerecorded

Fig.10

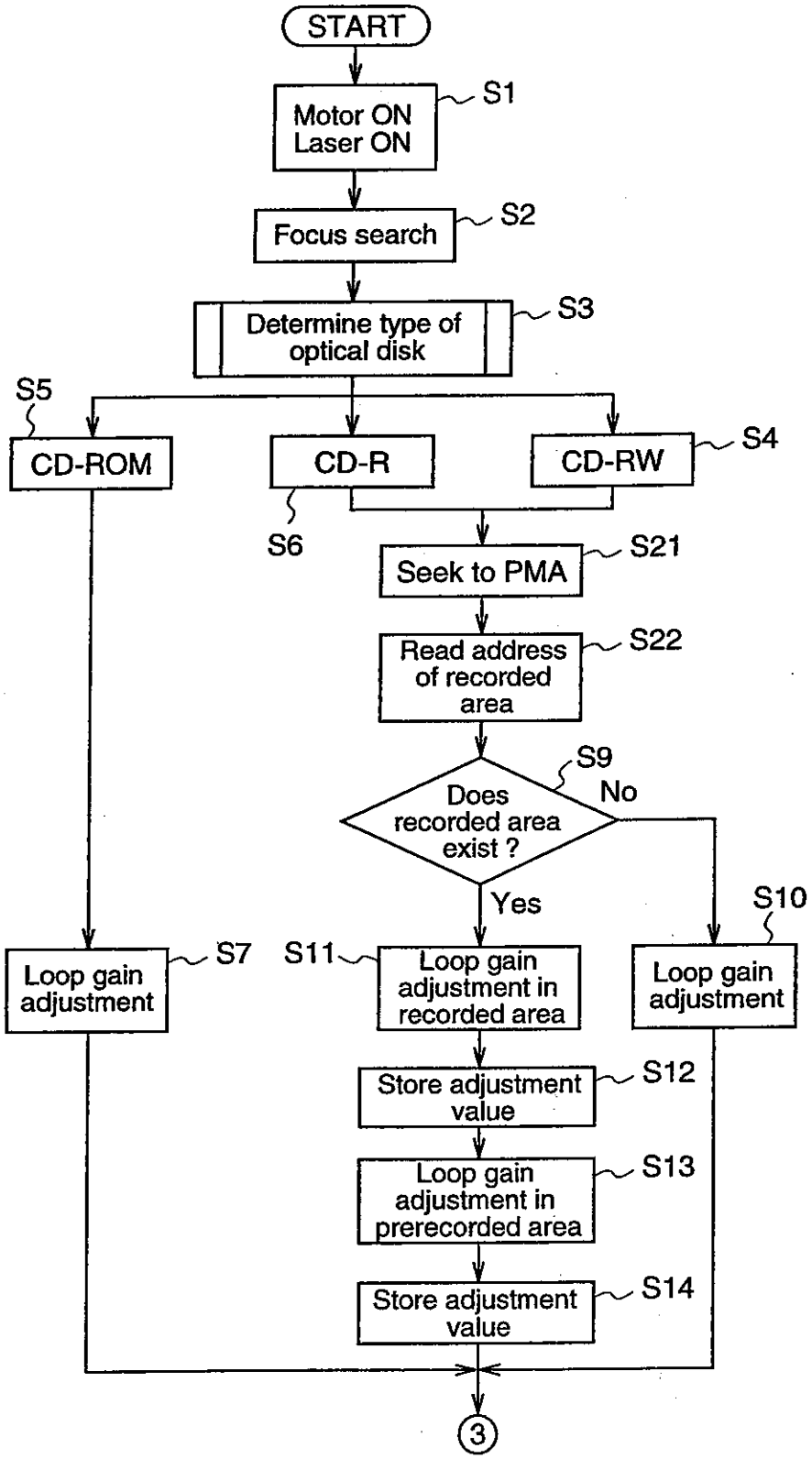

START
Motor ON
Laser ON
S1
Focus search
S2
Determine type of optical disk
S3
S5
CD-ROM
CD-R
CD-RW
S4
S6
Seek to PMA
S21
Read address of recorded area
S22
S9
Does recorded area exist ?
No
Yes
S10
Loop gain adjustment
S7
S11
Loop gain adjustment in recorded area
Loop gain adjustment
Store adjustment value
S12
Loop gain adjustment in prerecorded area
S13
Store adjustment value
S14
③

Fig.11

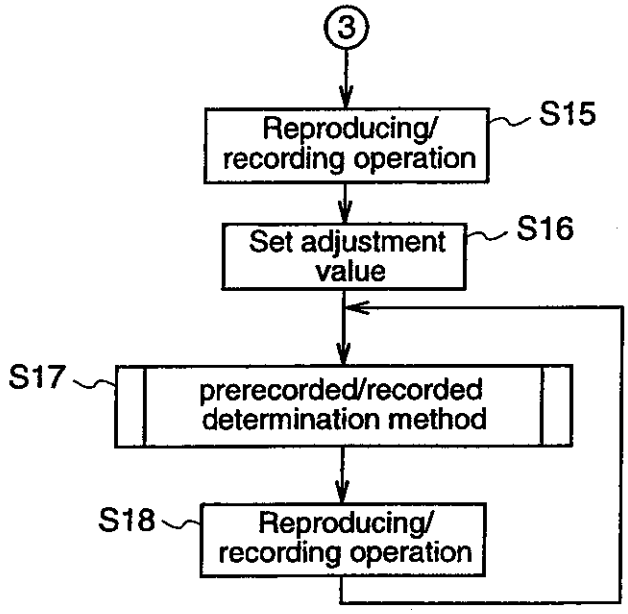
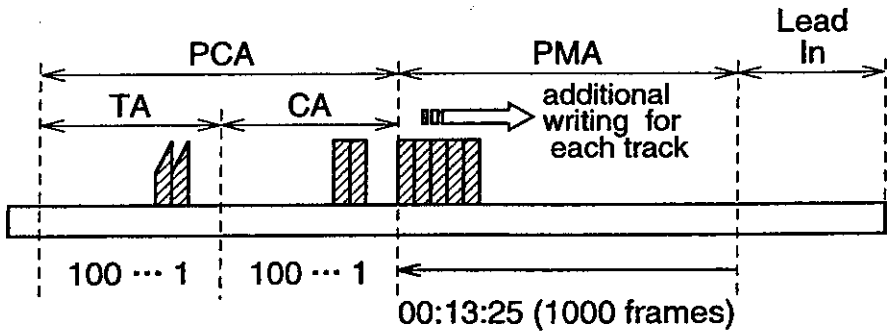

③
Reproducing/ recording operation
S15
Set adjustment value
S16
S17
prerecorded/recorded determination method
S18
Reproducing/ recording operation

Fig.12


PCA
PMA
Lead In
TA
CA
additional writing for each track
100 ··· 1
100 ··· 1
00:13:25 (1000 frames)

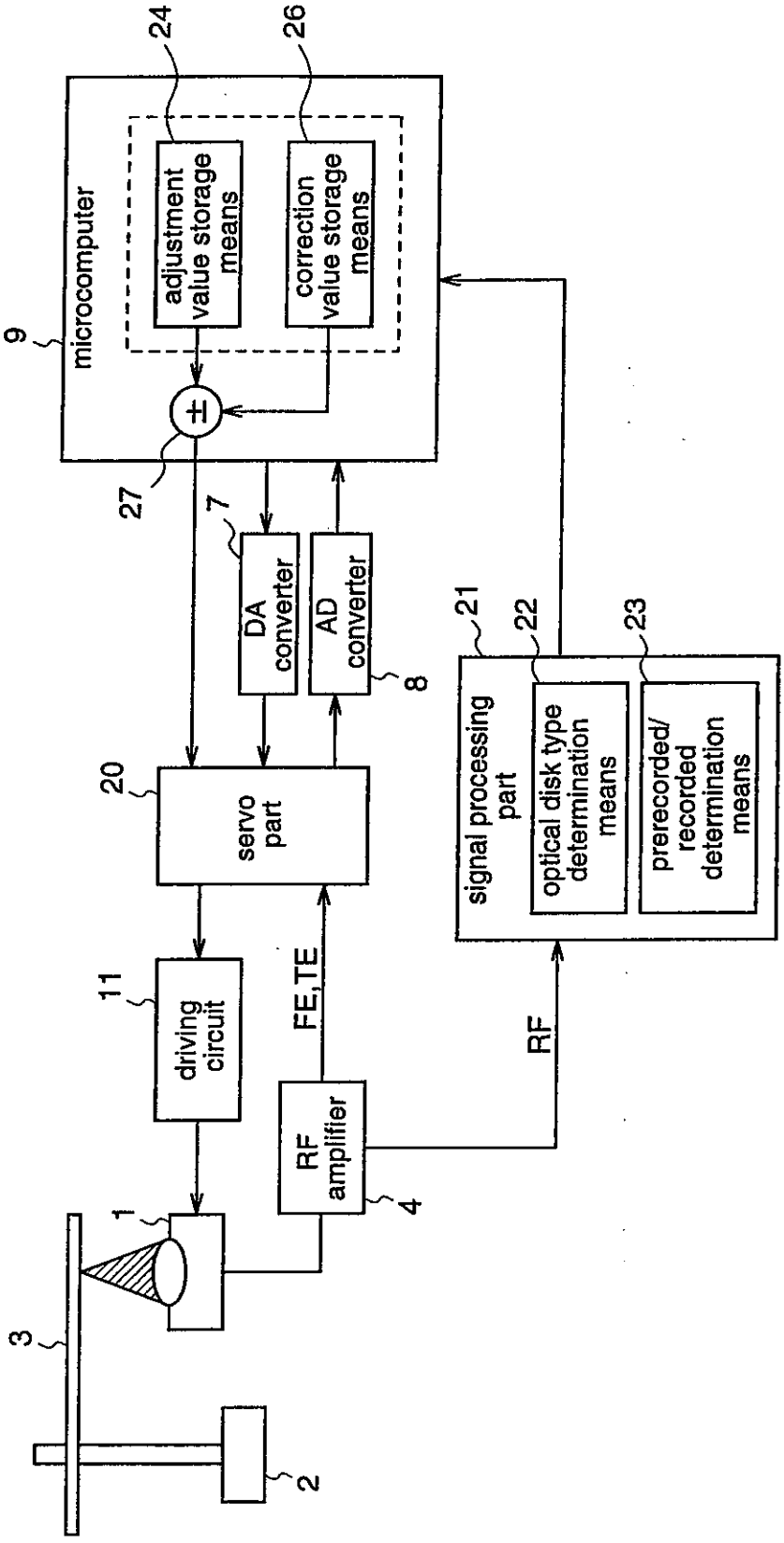

24
26
adjustment value storage means
correction value storage means
9
microcomputer
±
27
7
DA converter
AD converter
8
21
22
23
signal processing part
optical disk type determination means
prerecorded/ recorded determination means
20
servo part
11
driving circuit
FE,TE
RF
RF amplifier
4
1
3
2

Fig.13

Fig.14

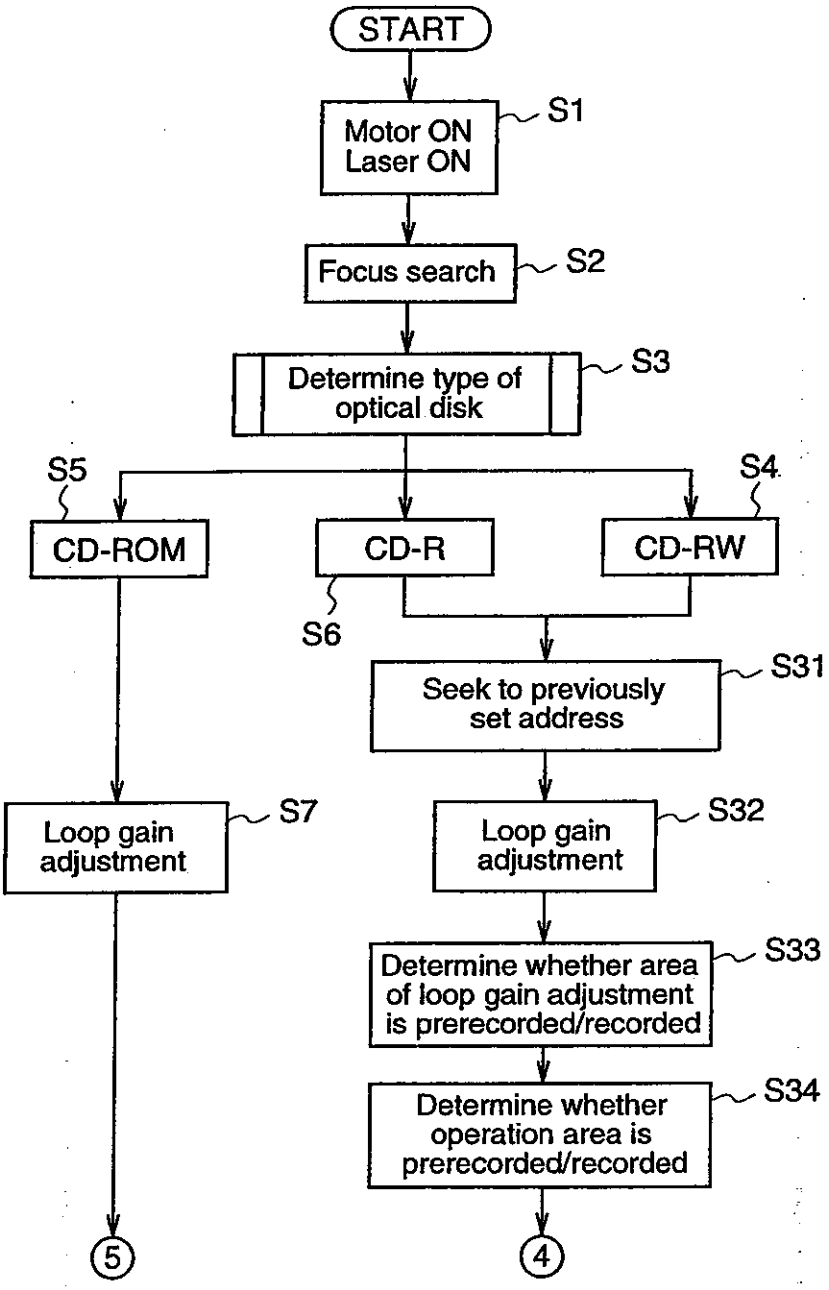
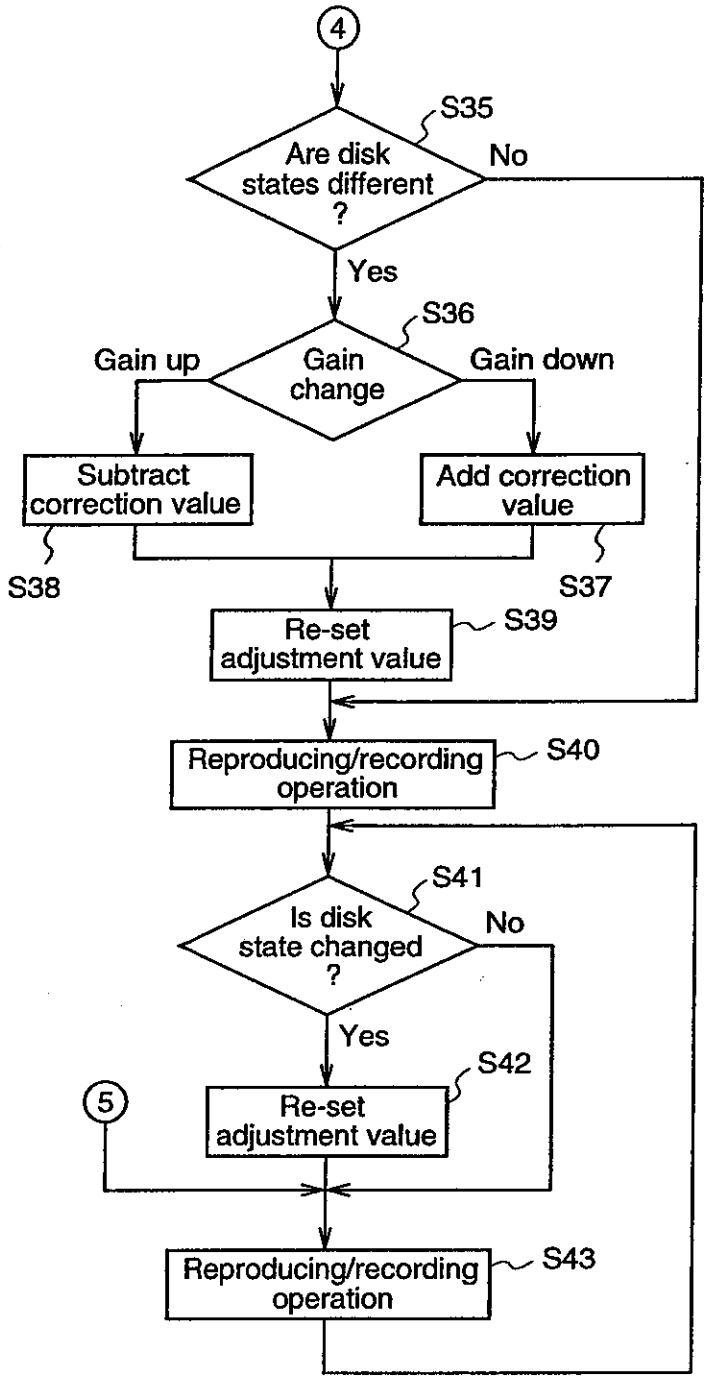

START
Motor ON
Laser ON
S1
Focus search
S2
Determine type of optical disk
S3
S5
S4
CD-ROM
CD-R
CD-RW
S6
Seek to previously set address
S31
Loop gain adjustment
S7
Loop gain adjustment
S32
Determine whether area of loop gain adjustment is prerecorded/recorded
S33
Determine whether operation area is prerecorded/recorded
S34
5
4

Fig.15


4
S35
Are disk states different ?
No
Yes
S36
Gain up
Gain change
Gain down
Subtract correction value
Add correction value
S38
S37
Re-set adjustment value
S39
Reproducing/recording operation
S40
S41
Is disk state changed ?
No
Yes
S42
5
Re-set adjustment value
Reproducing/recording operation
S43

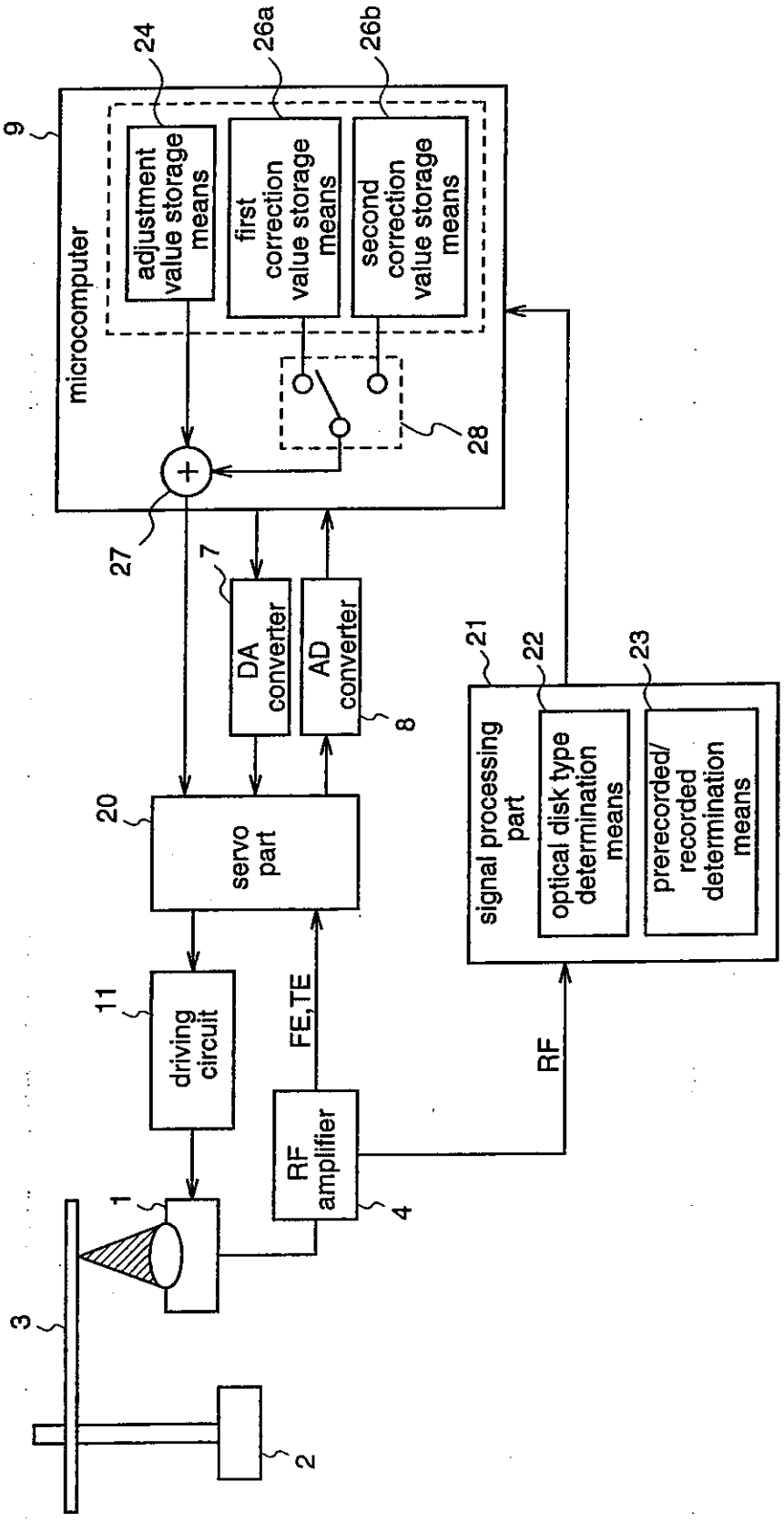

9
microcomputer
24
adjustment value storage means
26a
first correction value storage means
26b
second correction value storage means
28
27
7
DA converter
AD converter
8
20
servo part
11
driving circuit
FE,TE
RF amplifier
4
1
3
2
RF
21
signal processing part
22
optical disk type determination means
23
prerecorded/ recorded determination means

Fig.16

Fig.17

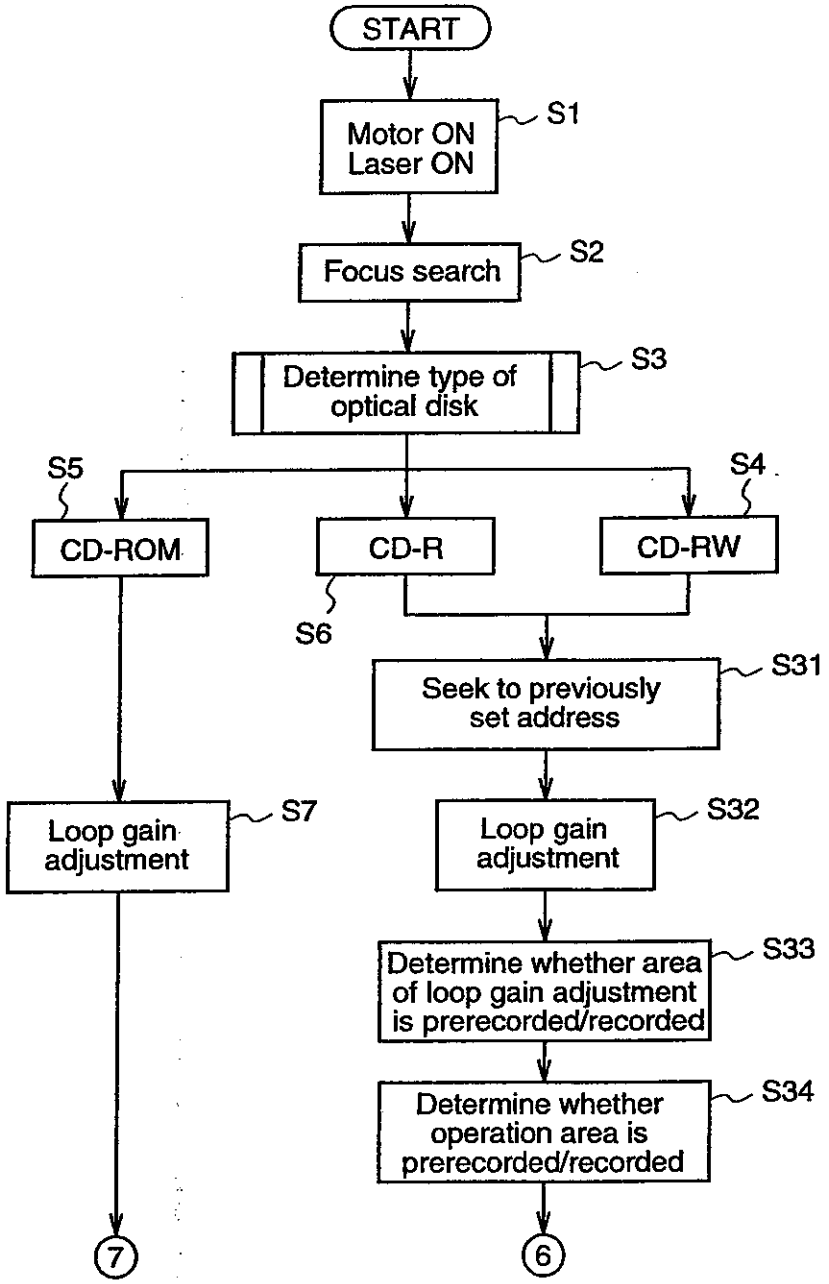
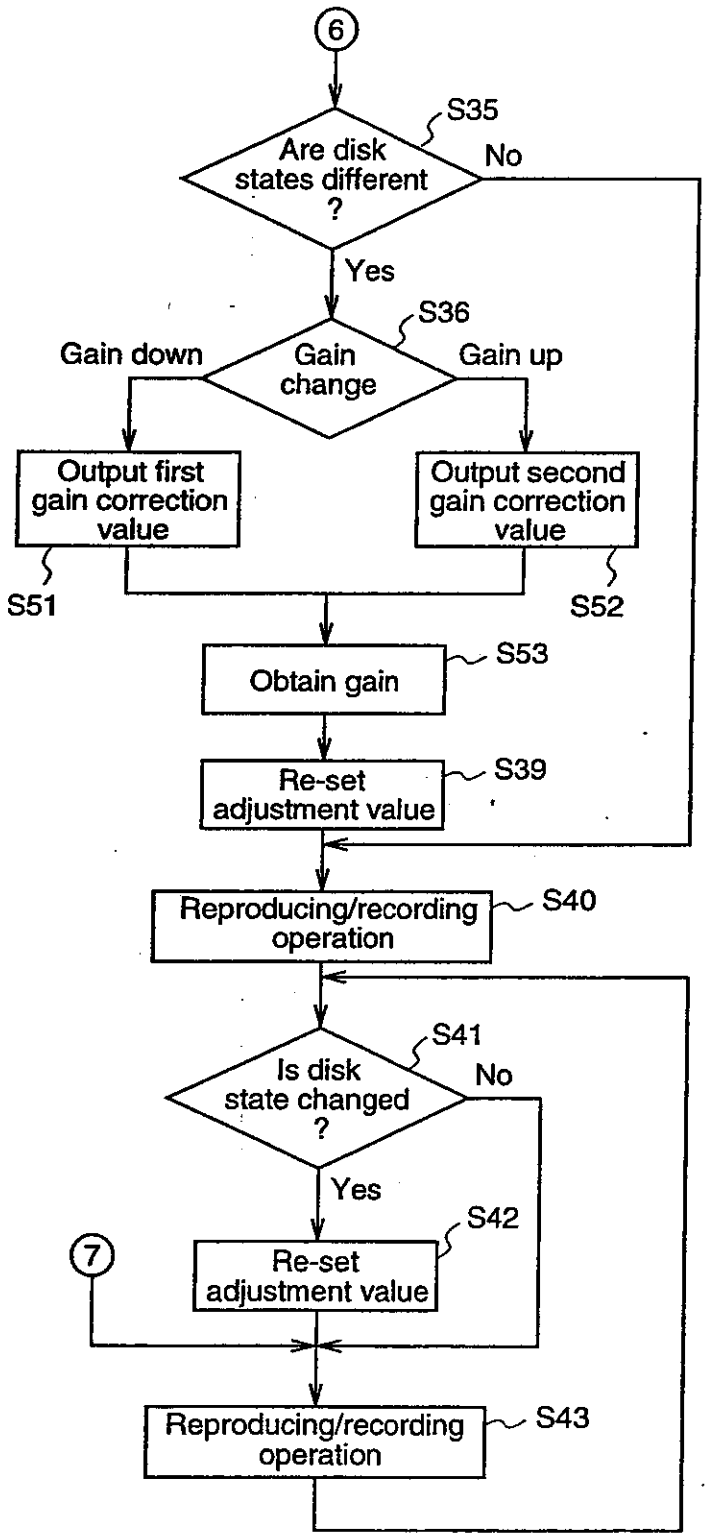

START
Motor ON
Laser ON
S1
Focus search
S2
Determine type of optical disk
S3
S5
S4
CD-ROM
CD-R
CD-RW
S6
Seek to previously set address
S31
Loop gain adjustment
S7
Loop gain adjustment
S32
Determine whether area of loop gain adjustment is prerecorded/recorded
S33
Determine whether operation area is prerecorded/recorded
S34
7
6

Fig.18


6
S35
Are disk states different ?
No
Yes
S36
Gain down
Gain change
Gain up
Output first gain correction value
Output second gain correction value
S51
S52
Obtain gain
S53
Re-set adjustment value
S39
Reproducing/recording operation
S40
S41
Is disk state changed ?
No
Yes
7
S42
Re-set adjustment value
Reproducing/recording operation
S43

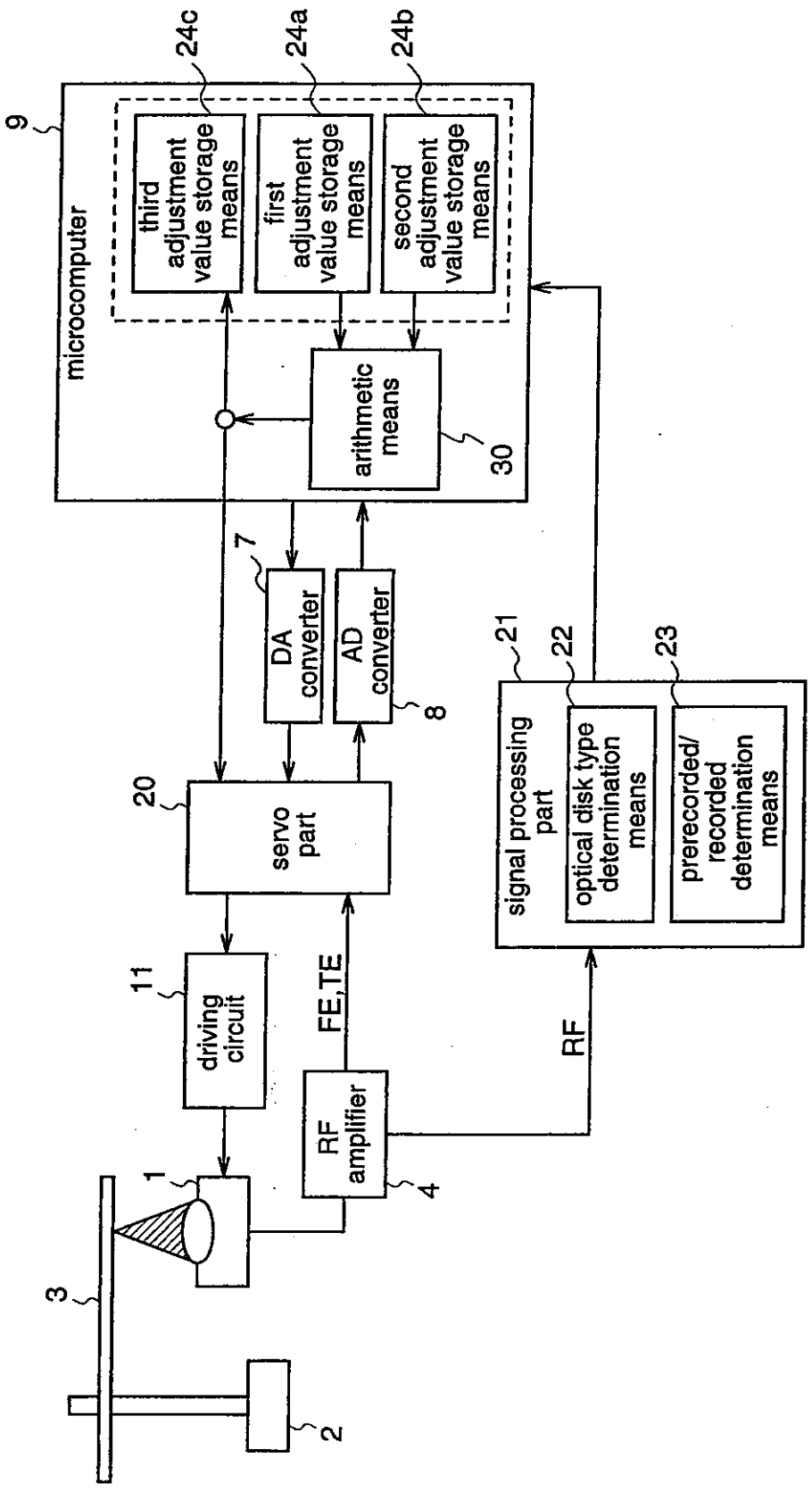

9
microcomputer
24c
third adjustment value storage means
24a
first adjustment value storage means
24b
second adjustment value storage means
arithmetic means
30
7
DA converter
AD converter
8
20
servo part
11
driving circuit
FE,TE
RF amplifier
4
1
3
2
RF
21
signal processing part
22
optical disk type determination means
23
prerecorded/ recorded determination means

Fig.19

Fig.20

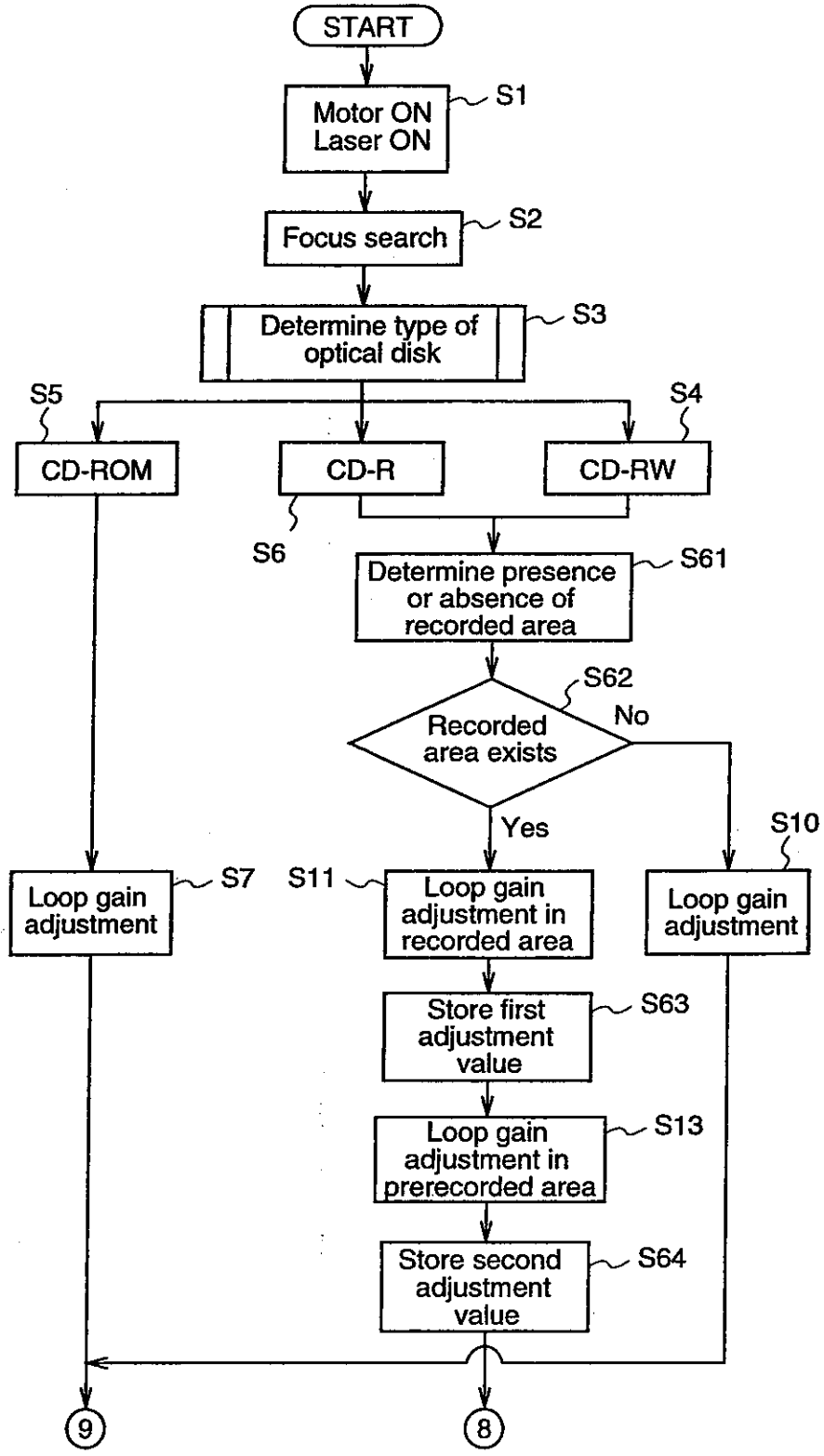
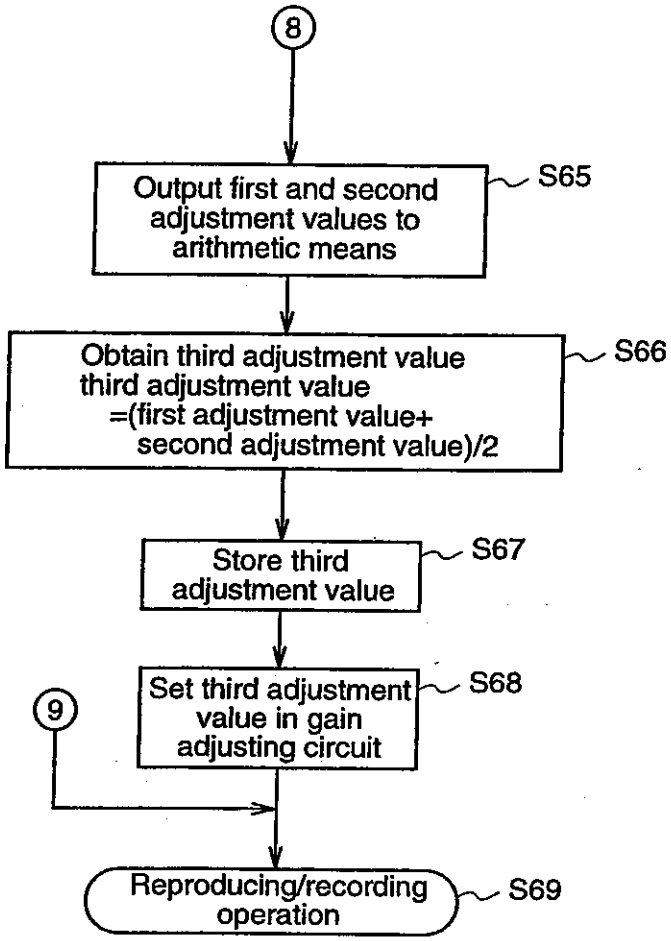

START
Motor ON
Laser ON
S1
Focus search
S2
Determine type of optical disk
S3
S5
S4
CD-ROM
CD-R
CD-RW
S6
Determine presence or absence of recorded area
S61
S62
Recorded area exists
No
Yes
S10
Loop gain adjustment
S7
S11
Loop gain adjustment in recorded area
Loop gain adjustment
Store first adjustment value
S63
Loop gain adjustment in prerecorded area
S13
Store second adjustment value
S64
9
8

Fig.21


8
Output first and second adjustment values to arithmetic means
S65
Obtain third adjustment value third adjustment value =(first adjustment value+ second adjustment value)/2
S66
Store third adjustment value
S67
Set third adjustment value in gain adjusting circuit
S68
9
Reproducing/recording operation
S69

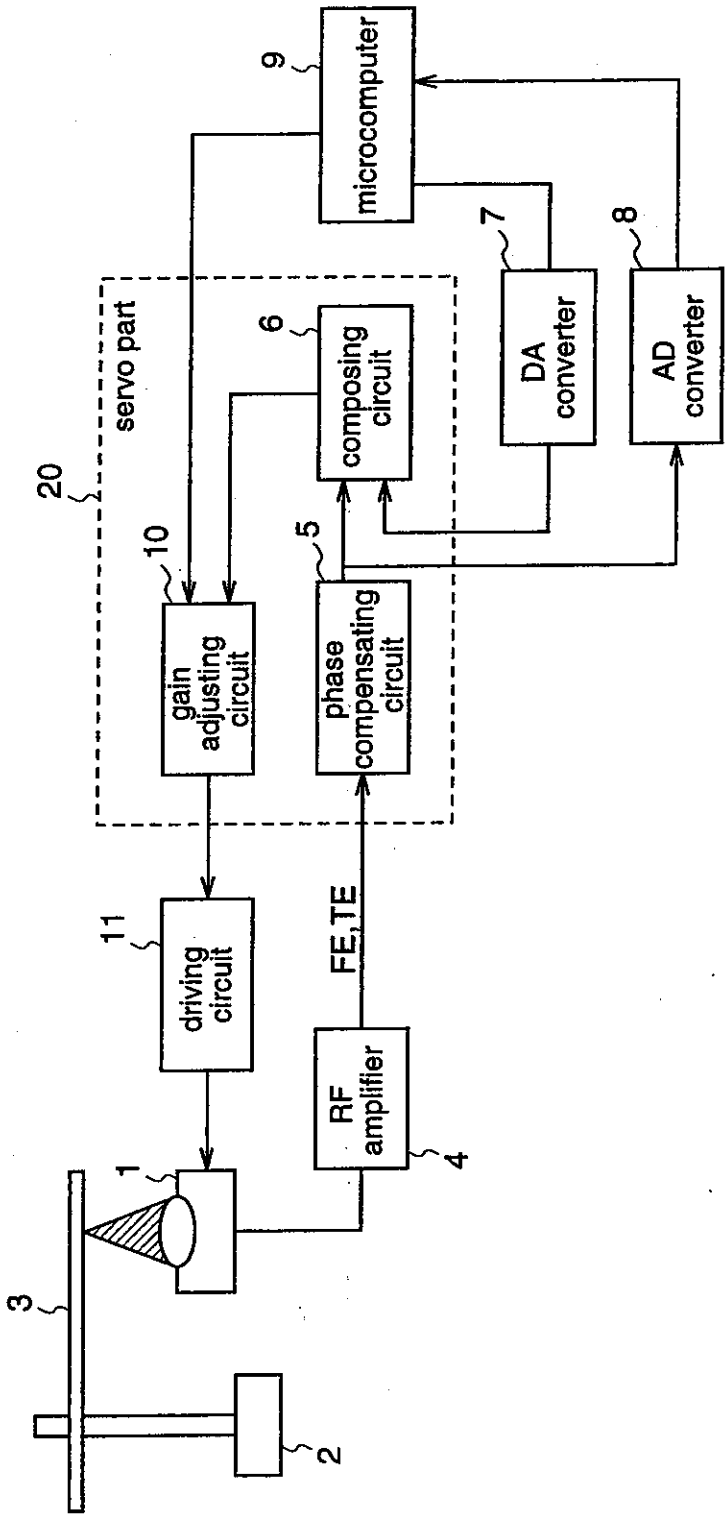
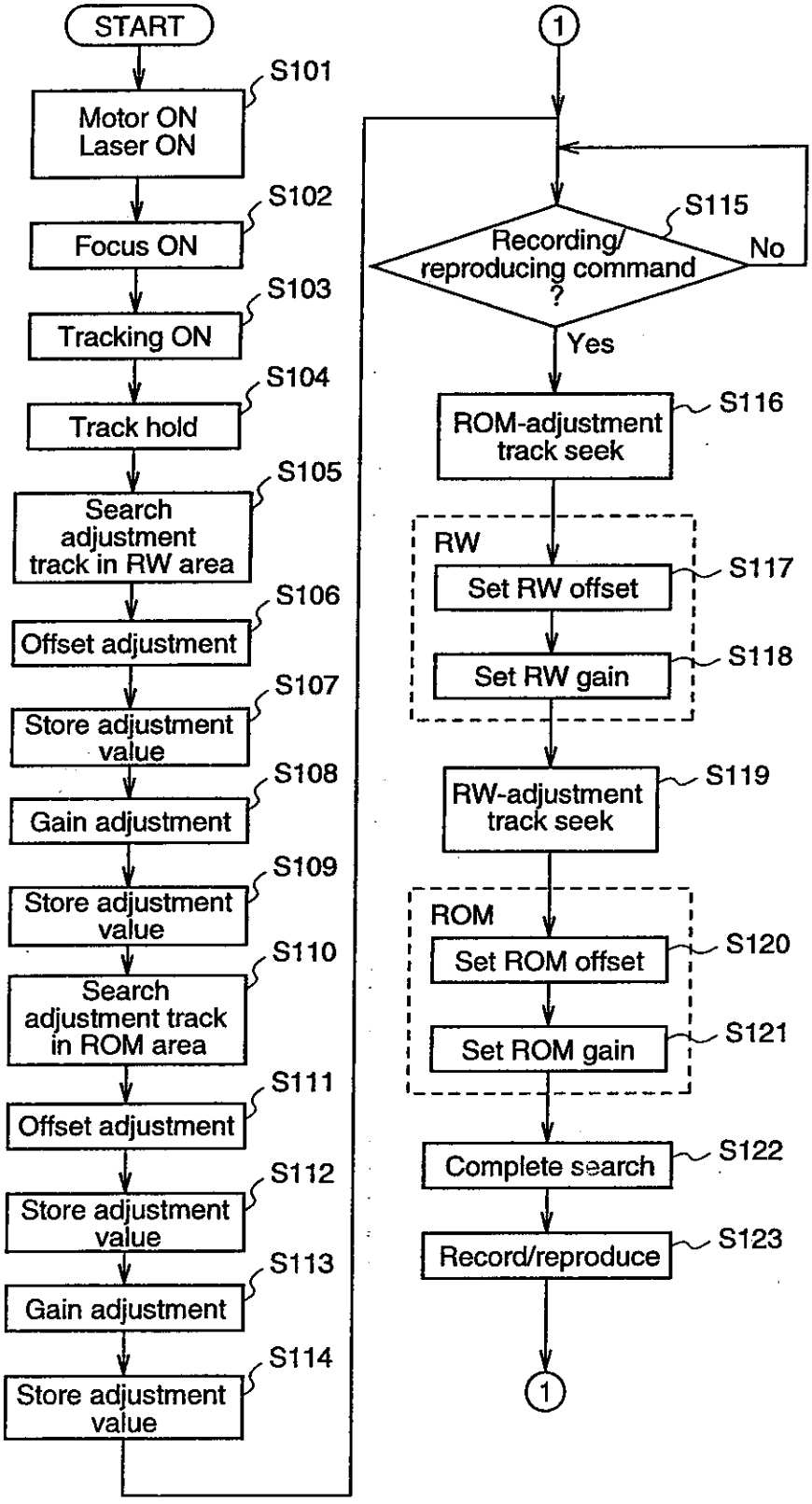

microcomputer
9
servo part
20
composing circuit
6
DA converter
7
AD converter
8
gain adjusting circuit
10
phase compensating circuit
5
driving circuit
11
FE,TE
RF amplifier
4
1
3
2

Fig.22

Fig.23


START
S101
Motor ON
Laser ON
S102
Focus ON
S103
Tracking ON
S104
Track hold
S105
Search adjustment track in RW area
S106
Offset adjustment
S107
Store adjustment value
S108
Gain adjustment
S109
Store adjustment value
S110
Search adjustment track in ROM area
S111
Offset adjustment
S112
Store adjustment value
S113
Gain adjustment
S114
Store adjustment value
1
S115
Recording/ reproducing command ?
No
Yes
S116
ROM-adjustment track seek
RW
S117
Set RW offset
S118
Set RW gain
S119
RW-adjustment track seek
ROM
S120
Set ROM offset
S121
Set ROM gain
S122
Complete search
S123
Record/reproduce
1