INC
JAA52751 - R.3556.A

作成承認印	配布許可印
ニコン映像カンパニー CS推進部 GM	

AF-S Nikkor ED 600mm/f4D II IF

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Recycled paper

Printed in Japan August 2001

Specifications

1. Main specifications

Focal length :	600mm
Maximum aperture :	1 : 4
Lens construction :	11 elements in 7 groups (One protective glass is built in.) ED glass (G2, G3, G6)
Picture angle :	With 135 system camera 4° 10′ With IX240 system camera 3° 20′ With Nikon Digital camera D1 2° 40′
Distance scale :	∞～5.4m
Focusing :	G7～G9 Moving type
Aperture scale :	4, 5.6, 8, 11, 16, 22
Diaphragm :	Full automatic (Minimum aperture lock is possible.)
Mount :	Nikon F mount
Filters :	Rear setting type 52 mm (P=0.75mm)
Tripod socket :	360° rotary type
Dimension :	166.0mm (dia) ×430.5mm (Maximum length)
Weight :	Approx 4,750g (Including the tripod socket)

2. Function

Operation outline

AF : Automatic focus FA : Focus aid AE : Automatic exposure

Camera body \ Lens	AF	FA	AE
F5, F4, F100, F90, F90X, F80, F70D PRONEA600i, PRONEA S, D1	○	○	○
AF Cameras except the above cameras (except F3AF)	×	○	○
Others except AF	×	×	○
F3AF	×	×	×

Focus mode

M : Manual focus AF : Automatic focus FA : Focus aid

Camera body \ Focus mode		Lens mode M	Lens mode M／A	Lens mode A
F5, F4, F100, F90, F90X, F80 F70D, PRONEA600i PRONEA S, D1	C	MF photographing (FA is available.)	Prior MF/AF photographing	AF photographing
	S			
	M	MF photographing (FA is available.)		Not usable
AF Cameras except the above cameras (except F3AF)	C	MF photographing (FA is available.)		Not usable
	S			
	M			
Others except AF		MF photographing		Not usable

MF photographing : The MF ring is rotated manually.

Prior MF/AF photographing : AF is actuated by lightly pressing the shutter release button. AF mode is changed to MF mode by rotating the MF ring manually while AF is actuated. MF mode is changed to AF mode by returning the shutter release button, and then AF is actuated by pressing the button lightly.

AF photographing : AF is actuated by lightly pressing the shutter release button.

3. Mount contacts

Contact	Contact Name	Application
A	Vcc	Power terminal of the lens CPU circuit
B	R／W1	Lens special lead/light terminal
C	CLOCK	Input of clock
D	DATA	Command input/data input and out put
E	Hot line・Pulse	Relative distance pulse output
F	Power supply for heavy load	Power supply for heavy load such as motor
G	GND for heavy load	GND for heavy load such as motor
H	Hot line・Pulse	Relative distance pulse output
I	Teleconverter CLOCK	Communication with teleconverter
J	Teleconverter DATA	Communication with teleconverter
Mount		Signal GND

＊The contacts are arranged in the order of A～J counterclockwise as viewed behind the lens (mount side).

4. Accessories

Front cap		
・Lens cap		(JXA10096)
Rear cap		
・Lens rear cap	LF-1	(JAD50101)
Teleconverter		
・Special teleconverter	TC-14E	(JAA90851)
	TC-20E	(JAA90951)
	TC-14E II	(JAA91051)
	TC-20E II	(JAA91151)
・Teleconverter	TC-14BS	(JAA90302)
	TC-301S	(JAA90203)
Case		
・Trunk case	CT-606	(JAE90804)
・Semi－soft case	CL-L2	(JAE30201)
Hood		
・Covering hood	HK-29-1,-2	(JAB63201)

Not mountable products

※Because of the interference of the lens mount contact part

・Automatic extension ring	PK-1	(20FA33P1)
	PK-11	(FPW00702)
	PK-11A	(FPW00703)
・K ring	K1	(20FA32K)
・Automatic ring for bellows	BR-4	(FPW00401)

DISASSEMBLING/ASSEMBLING/ADJUSTMENT

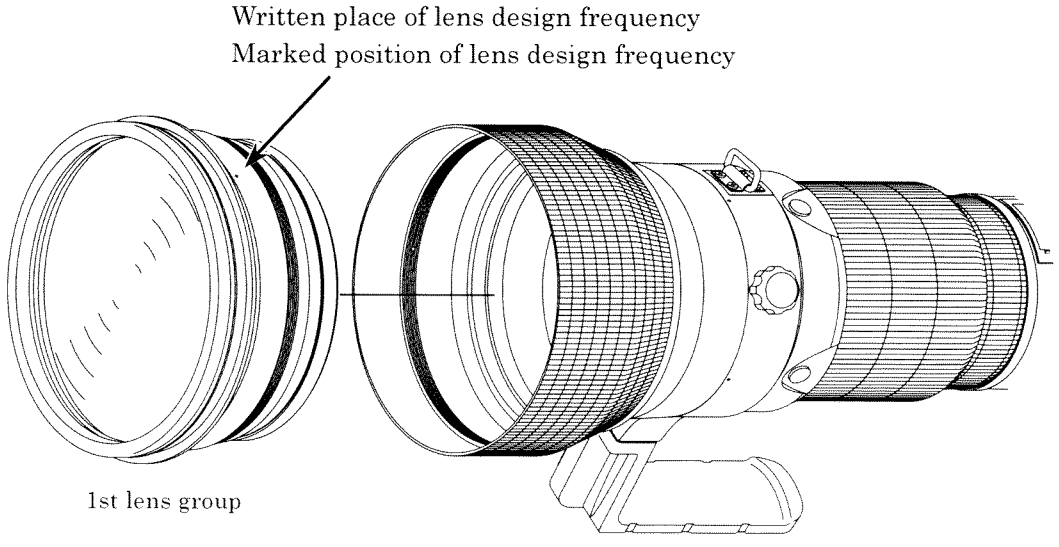
Notes:

The basic construction of AF-S600/4D II (JAA52751) is the same as the present AF-S telephoto lens. As the internal parts construction except the shape and construction of the external appearance parts is the same as AF-S400/2.8D II (JAA52551), this Repair Manual indicates only the points to be attended to at disassembling and the adjustment values of which standards are different. Therefore, please refer to Repair Manual for AF-S400/2.8D II (JAA52551).

【Design frequency of lens】

The refractive index of a lens glass is different for every production lot. One glass has almost the same refractive index as the other if they are produced in the same lot. If the production lot of one glass is different from the other, the radius of curvature must be changed according to the change of the refractive index. The optical design for this reason is called "design frequency". When a glass produced in a different lot is used for replacement during lens repair, aberration or others are adversely affected and a trouble occurs.

When repairing a part of glass with the design frequency, the glass with the same design frequency must be used.



Note : The number of times of designing the lens shall be stated as follows.

For the first time: Marking made as '1R'

For the second time: Marking made as '2R'

For the third time: Marking made as '3R'

Followed by '4R', '5R', '6R' and so on.

APERTURE DIAMETER ADJUSTMENT

Aperture Setting	Inscribed circle Diameter (mm)	Allowable range (mm)
4	38.40	39.72～37.16
5.6	27.54	30.90～24.54
8	19.41	21.78～17.29
11	13.67	15.96～11.72
16	9.64	11.25～ 8.26
22	6.82	7.96～ 5.85

ADJUSTMENT FOR SCANNING SPEED/INSPECTION FOR DRIVING FREQUENCY

The numerical value of scanning speed: 5.1±0.2sec (9±0.4rpm)

ADJUSTMENT AND CHECK F.F.D.(BACK FOCUS), "∞" ALIGNMENT

①Set the focus ring to "∞" and the aperture to "maximum(f4)".

②Read the M.B.f. value and check if it is within the standards.

③When the M.B.f. value is out of standard, remove the 1st, 2nd and 3rd lens group and then adjust the difference between the standard and the read value by using the washer#284 of the 3rd lens group.

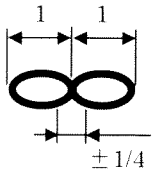
When the difference is positive : Thicken the washer.

When the difference is positive : Thin the washer.

Standard: 0±0.25mm

④When the M.B.f. value is within the standard, check the "∞" alignment with a collimater.

Standard: ±1／4 of "∞"



・If the F.F.D adjustment is impossible, adjust the "∞" alignment in the same way.

LENS OPERATION CHECK

Refer to the page L38 to L47 in the repair manual for AF-S80-200/2.8D(JAA76551) and check the operational conditions.

In addition what is displayed on PC screen is slightly different from the statements in check list.

The followings are the tolerances for standards.

(2) Image of "operation of MR encoder"

```
TYPE OF LENS : AF-S NIKKOR 600mm/4D II                CPU VERSION : 1.00.00
OPERATION OF MR ENCODER

POSITION WHEN CHECK BEGINS [PULSE (S)] ..... 341
POSITION WHEN CHECK IS ENDED [PULSE (S)] ..... 340
PULSE NUMBER DIFFERENCE BEFORE/AFTER CHECK. [PULSE (S)] ..... -1
STANDARD FOR DIFFERENCE IN NUMBER PULSE  -10 TO 10  [PULSE (S)]
                                                          IN STANDARD.
**********************************************************
THE TOTAL NUMBER OF PULSE(S) AT INSPECTION [PULSE (S)] ..... 19941
STANDARD FOR THE NUMBER : 19700  TO  20125  [PULSE (S)]
                                                          IN STANDARD.



PUSH ESC KEY TO RETURN TO MENU.
```

(3) Image of "lens driving stop accuracy"

```
TYPE OF LENS : AF-S NIKKOR 600mm/4D II                CPU VERSION : 1.00.00
INSPECTION OF DRIVING STOP ACCURACY.
①→NUMBER OF LENS GO-AND-RETURN OPERATIONS.                :      5/5 TIME(S).
  NUMBER OF LENS DRIVING TIMES (DF0+DF1+DF2+DF3+DF4+DF5+DF6)  :    608 TIME(S).
  MAXMUM PULSEABS. (VALUE) (DF0+DF1+DF2+DF3+DF4+DF5+DF6)      :     10 PULSE(S).
  OVER (OR UNDER) RUN PULSE(S).                           :      0 PULSE(S).
  LENS DRIVING TIME   :  DF1=103  DF2=103  DF3=101  DF4=101  DF5=97  DF6=93
  DIRECTION           :        INF → CLOSE              CLOSE → INF
  AMOUNT              :   DF1     DF2     DF3        DF1     DF2     DF3
  UNDER(-), OVER(+)   :  (-)(+)  (-)(+)  (-)(+)     (-)(+)  (-)(+)  (-)(+)
        0 - 11        :  24 28   39 13   50  1      4 47    1 50    1 49
       12 - 33        :   0  0    0  0    0  0      0  0    0  0    0  0
       22 - 33        :   0  0    0  0    0  0      0  0    0  0    0  0
④→     34 -          :   0  0    0  0    0  0      0  0    0  0    0  0
  DIRECTION           :        INF → CLOSE              CLOSE → INF
  AMOUNT              :   DF4     DF5     DF6        DF4     DF5     DF6
  UNDER(-), OVER(+)   :  (-)(+)  (-)(+)  (-)(+)     (-)(+)  (-)(+)  (-)(+)
        0 - 11        :  16 35   20 29   28 19     16 34    5 43    6 40
       12 - 33        :   0  0    0  0    0  0      0  0    0  0    0  0
       22 - 33        :   0  0    0  0    0  0      0  0    0  0    0  0
⑤→     34 -          :   0  0    0  0    0  0      0  0    0  0    0  0
②→   RATIO (1)  (%)   : Df1=0.00  Df2=0.00  Df3=0.00  Df4=0.00  Df5=0.00  Df6=0.00
③→   RATIO (2)  (%)   : Df1=0.00  Df2=0.00  Df3=0.00  Df4=0.00  Df5=0.00  Df6=0.00
  PUSH ESC KEY TO RETURN TO MENU.
```

Note : If the MF ring is rotated during lens scanning, an error value is shown for the pulses.
Don't touch the MF ring during operation.
The above image is displayed during lens scanning. Execute inspection for the 5 postures as mentioned below.

(Lens posture at inspection)

Lens inclination	Position of index window
Horizontal	Up, left and right
Front group 90° upward	
Front group 90° downward	

The pulses of overrun／underrun must be within the standards after the lenses have reciprocated five times ("5／5 TIME(S). in ① of the image").

Standards RATIO(1) is 40% or less for Df1～Df6 ——— ② of the image
(Occurrence ratio of 12～33 pulses)

RATIO(2) is 10% or less for Df1～Df6 ——— ③ of the image
(Occurrence ratio of 22～33 pulses)

Occurrence of 34 or more pulses is 0 for Df1～Df6 ——— ④ and ⑤ of the image
(It is malfunction if there is only one occurrence.)

※Df1～Df6 shown the lens driving amount.

(4) Image of "lens servo time"

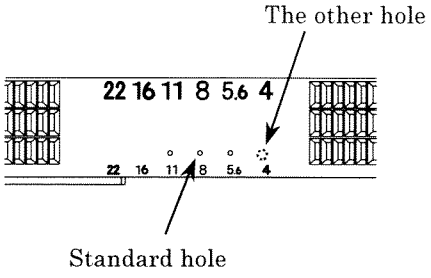
```
TYPE OF LENS : AF-S NIKKOR 600mm/4D II          CPU VERSION : 1.00.00
INSPECTION OF LENS SERVO TIME.

-------------------------------------------------------------------------
  SERVO AMOUNT                          STANDARD
1 . [ Df1 ]                          35ms OR LESS.
2 . [ Df2 ]                          45ms OR LESS.
3 . [ Df3 ]                          54ms OR LESS.
4 . [ Df4 ]                          66ms OR LESS.
5 . [ Df5 ]                          83ms OR LESS.
6 . [ Df6 ]                          95ms OR LESS.
-------------------------------------------------------------------------

7 . DRIVE TO INFINITY.
8 . DRIVE TO CLOSE.


SELECT A NUMBER.
PUSH ESC KEY TO MENU.
```

ATTACHING METER COUPLING SHOE



①Take out diaphragm ring #28.
②Drill a 1.1 mm hole at dented part near F8 mark (standard).
③Put a aperture coupling to standard hole, then drill the other hole.
④Attach meter coupling shoe.

Meter coupling shoe	1K406−029 ×1
Screw	1K010−002−1 ×2

⑤Assembling.

【Special setting of RP No. for glass parts according to the lens design frequency】

There is lens design frequency for AF-S600/4D II (JAA52751) .When replacing a glass part, check the special setting of RP No. and then request a part of the same design frequency.

Notes: The part numbers of the glass parts are the same as AF-S600/4D (JAA52251). However, since the design frequency is set every product code, even the part number and the design frequency are the same, the material of glass is different and they are not interchangeable. Therefore, the parts for AF-S600/4D II (JAA52751) has [-1] at the end of the part number for identification.

RP No.

1 G◎◎◎－◎◎◎－△□ or 1 B◎◎◎－◎◎◎－△□

Example) 1 G 1 1 7 － 0 5 1 － 0 C － 1

- 1 G 1 1 7 － 0 5 1 : G2 lens
- 0 : Initial figure
- C : 3rd lens design
- 1 : Special part for AF-S600/4D II (JAA52751)

◎: Conventional figure number

△: Figure correction frequency (Numeral)

□: Lens design frequency (Alphabet)

Notes: Alphabets are used for distinction of the lens design frequency. The meaning of a capital letter is different from that of a small letter. Request a part correctly.

Meaning of △	
0	Initial figure
1	1st figure correction
2	2nd figure correction
3	3rd figure correction
4	4th figure correction
5	5th figure correction
・	・
・	・
・	・
・	・
・	・
・	・
・	・
・	・

Meaning of □	
A	1st lens design
B	2nd lens design
C	3rd lens design
・	・
・	・
・	・
Z	26 th lens design
a	27th lens design
b	28th lens design
c	29th lens design
・	・
・	・
・	・
z	52nd lens design

(For "a" and after, small alphabet letters are used.)

TOOLS

1 . Measuring instruments (Main)

Tool No.	Name	Remarks
J15306	AF-I Communication box	The tool used for AF-I is used again
J15307	AF-I Communication adapter	The tool used for AF-I is used again
J15334	H8 D／A converter (F／V converter)	For adjusting the scanning speed
J15352	Communication tool	Used for inspection and adjustment for output from the MR encoder
J15353	Communication tool	For adjustment the Main FPC
J15355	Switching tool	For adjustment the Main FPC
J18323	AF-S TELE LENS Inspection and adjustment software	IBM 3.5-inch

2 . Hand-made tool

	Name	Remarks
Tool	SWM rotation actuating tool	The tool used for AF-S 300/2.8 is used again

INC

黒 赤 黄
1156 1157 1158
SWM unit
SWMユニット
Contact relay FPC
接点中継FPC (
黄 1160
赤 1125
黒 1159
Contact brush
接触ブラシ
Contact
接触
黒 1124
赤 1125
黄 1126
Yellow
Black
Red
Black
Yellow
Contact
接触
To lower side
下側へ
橙 1129
白 1127
赤 1128
接触ブラシ
Contact brush
Blue
M/A switch
M/Aスイッチ
レンジリミッター
Range limitter
白 1127
緑 1132
黄 1131
Red
Orange
White
Red
White
Green
DC/
DC/DC
Yellow
Red
Yellow
Black
549.0.0
Yellow
SWM/SW中継FPC
SWM/SW relay FPC
1005
茶 1144
青 1143
橙 1142
黄 1141
赤 1140
黒 1139
Brown
Blue
Orange
Yellow
Red
Black
磁気テープ Magnetic tape
1014
1015
MRセンサー付FPC
FPC with MR sensor
黒 1121
白 1122
青 1123
Black
Blue
White
Yellow
Orange
Red
1001
1010
メインFPC
Main FPC
FL_FPC

y FPC (1)
PC (1)

青 茶 橙 黄 赤 黒

1007 1008 1006 1149 1150 1148 1018 1147 1146 1145

DC/DCコンバータ
DC/DC converter

Brown
Orange
Red
Red
Black

side

上側へ

Blue

Green
Orange
White
Red

1137 黄
1136 白
1138 緑
1135 橙
1133 白
1134 赤
1155 橙
1154 白

White

M環検出
Rotation detector for manual focus ring

DC/DC中継FPC
DC/DC relay FPC

White

接点中継FPC (2)
Contact relay FPC (2)

Orange

絶対距離中継FPC
Absolute focal distance FPC

291
1004
1151 黒
1009
1153 白
1152 茶

Black
Red

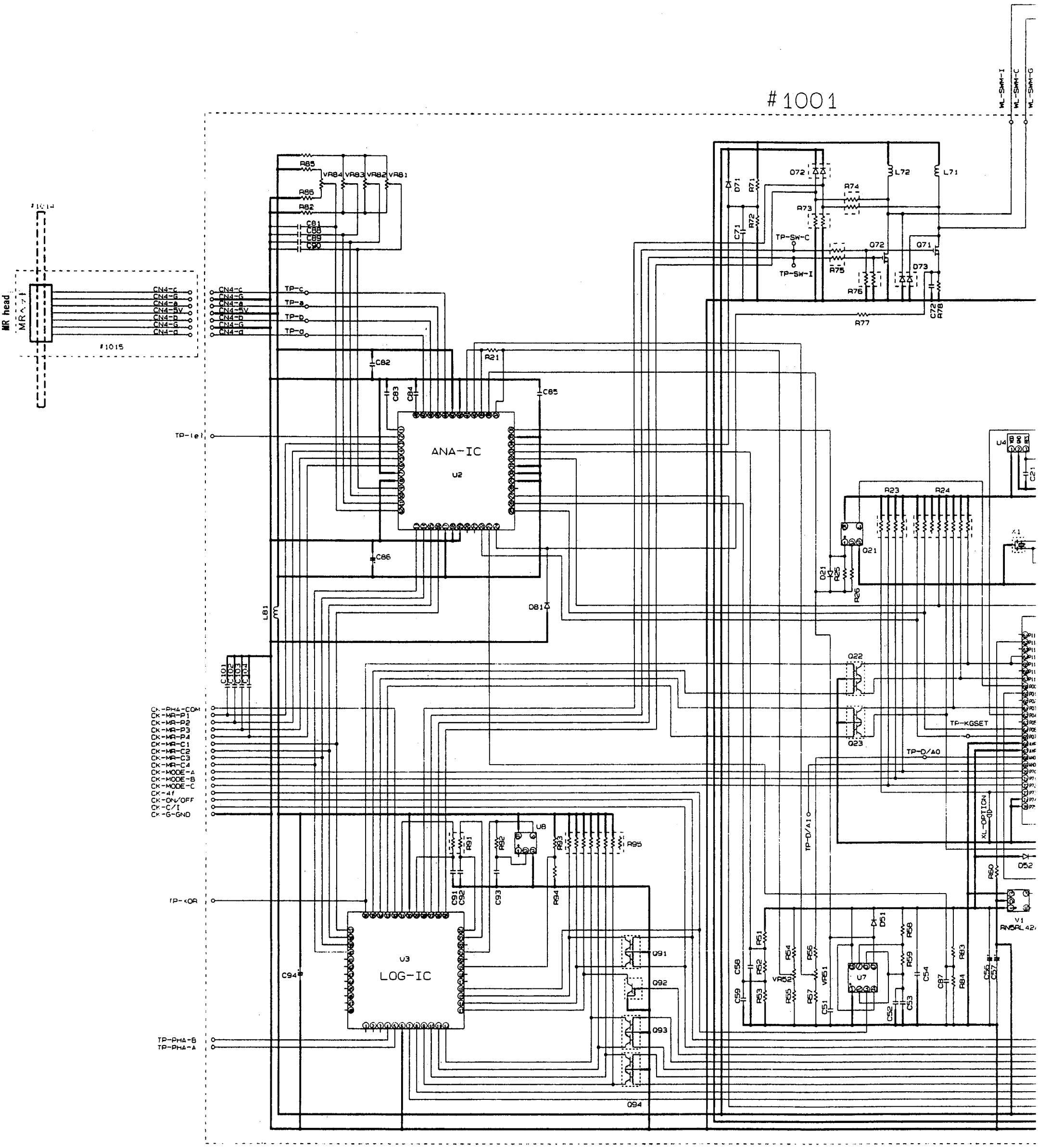
FL中継FPC
FL relay FPC

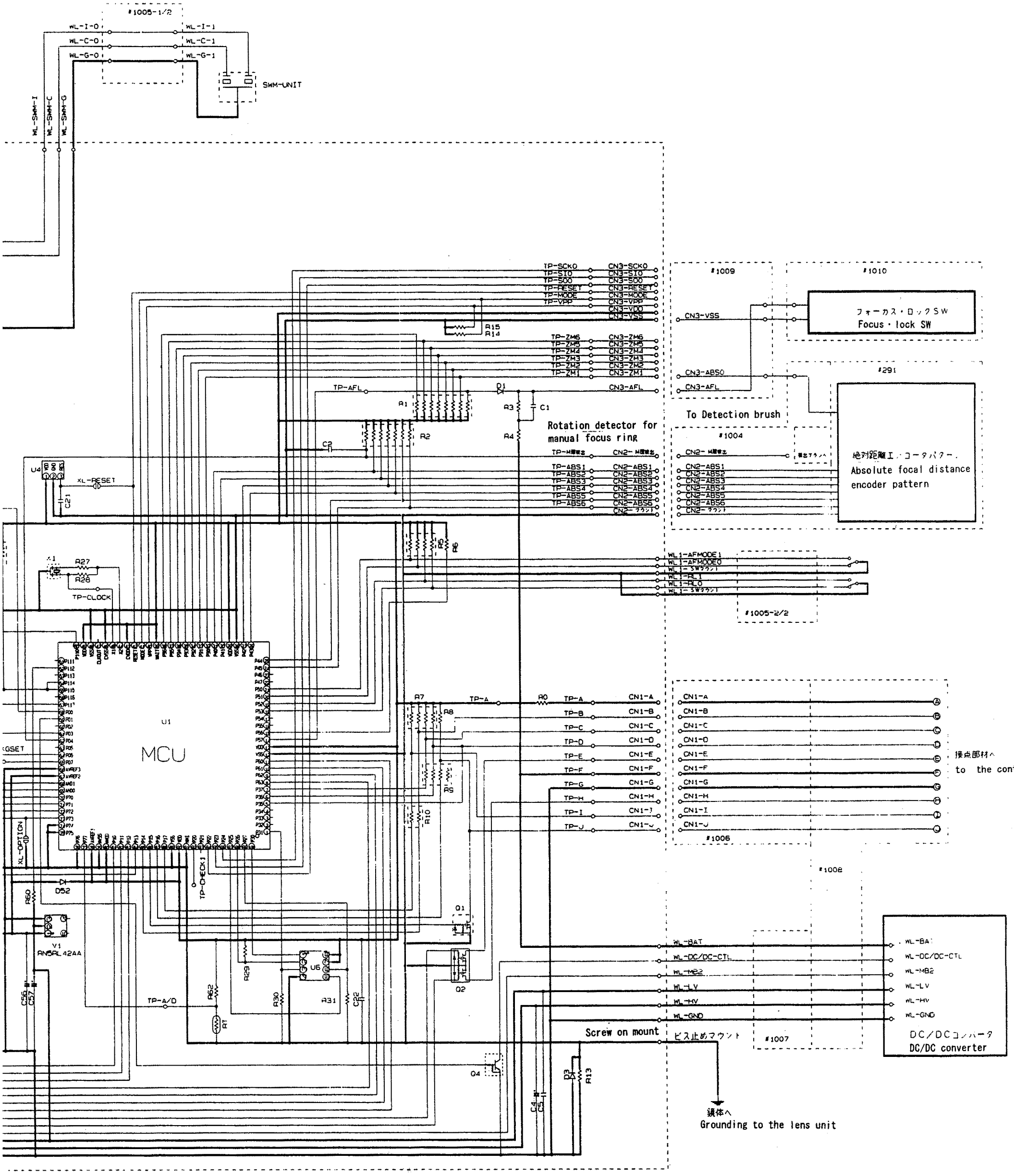
White

Brown
White

実体配線図 WIRING

回路図 CIRCUIT DIAGRAM




#1005-1/2
WL-I-0
WL-C-0
WL-G-0
WL-I-1
WL-C-1
WL-G-1
SWM-UNIT
WL-SWM-I
WL-SWM-C
WL-SWM-G
TP-SCK0
TP-SI0
TP-SO0
TP-RESET
TP-MODE
TP-VPP
TP-VDD
TP-VSS
CN3-SCK0
CN3-SI0
CN3-SO0
CN3-RESET
CN3-MODE
CN3-VPP
CN3-VDD
CN3-VSS
R15
R14
TP-ZM6
TP-ZM5
TP-ZM4
TP-ZM3
TP-ZM2
TP-ZM1
CN3-ZM6
CN3-ZM5
CN3-ZM4
CN3-ZM3
CN3-ZM2
CN3-ZM1
TP-AFL
CN3-AFL
D1
R1
R2
R3
R4
C1
C2
Rotation detector for manual focus ring
TP-ABS1
TP-ABS2
TP-ABS3
TP-ABS4
TP-ABS5
TP-ABS6
CN2-ABS1
CN2-ABS2
CN2-ABS3
CN2-ABS4
CN2-ABS5
CN2-ABS6
U4
XL-RESET
C21
X1
R27
R28
TP-CLOCK
R5
R6
WL1-AFMODE1
WL1-AFMODE0
WL1-RL1
WL1-RL0
#1005-2/2
U1
MCU
R7
R8
R9
R10
TP-A
R0
CN1-A
CN1-B
CN1-C
CN1-D
CN1-E
CN1-F
CN1-G
CN1-H
CN1-I
CN1-J
#1006
#1009
#1010
CN3-VSS
フォーカス・ロックSW
Focus・lock SW
#291
CN3-ABS0
CN3-AFL
To Detection brush
#1004
CN2-ABS1
CN2-ABS2
CN2-ABS3
CN2-ABS4
CN2-ABS5
CN2-ABS6
絶対距離エンコーダパターン
Absolute focal distance encoder pattern
接点部材へ
to the contacts
XL-OPTION
D52
R60
TP-CHECK1
V1
AN3RL42AA
C56
C57
TP-A/D
R62
RT
R29
R30
R31
C22
U6
Q1
Q2
Q4
D3
R13
C4
C5
#1008
WL-BAT
WL-DC/DC-CTL
WL-MB2
WL-LV
WL-HV
WL-GND
WL-BA
WL-DC/DC-CTL
WL-MB2
WL-LV
WL-HV
WL-GND
Screw on mount
ビス止めマウント
#1007
DC/DCコンバータ
DC/DC converter
鏡体へ
Grounding to the lens unit

AF－S600／4DⅡ　EEPROM

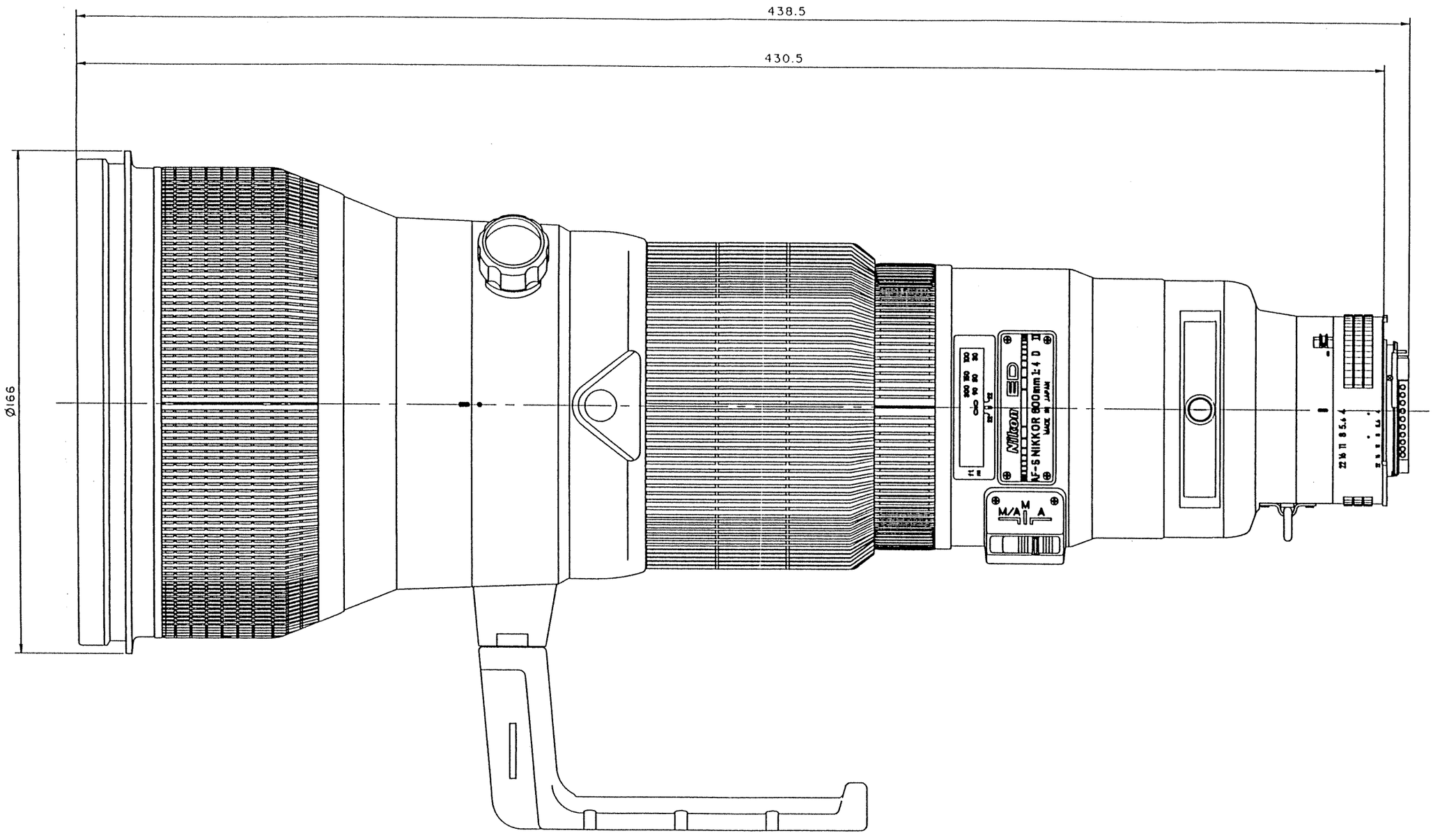
2001-8-10

Address	Contents	CPU			Others
		1.00.00			
0	Optional set value	0			
1	Data for controlling the lens	1			
2	Data for manufacturing processes	－			
3	Value for control and adjust for motor	－			
4	Data for controlling the lens	0			
5	〃	0			
6	〃	0			
7	〃	0			
8	〃	1			
9	〃	1			
10	〃	1			
11	〃	1			
12	〃	0			
13	Unused	－			
｜	｜	｜			
26	Unused	－			
27	Checksum data	－			
28	Data for controlling the lens	－			
｜	｜	｜			
127	Data for controlling the lens	－			

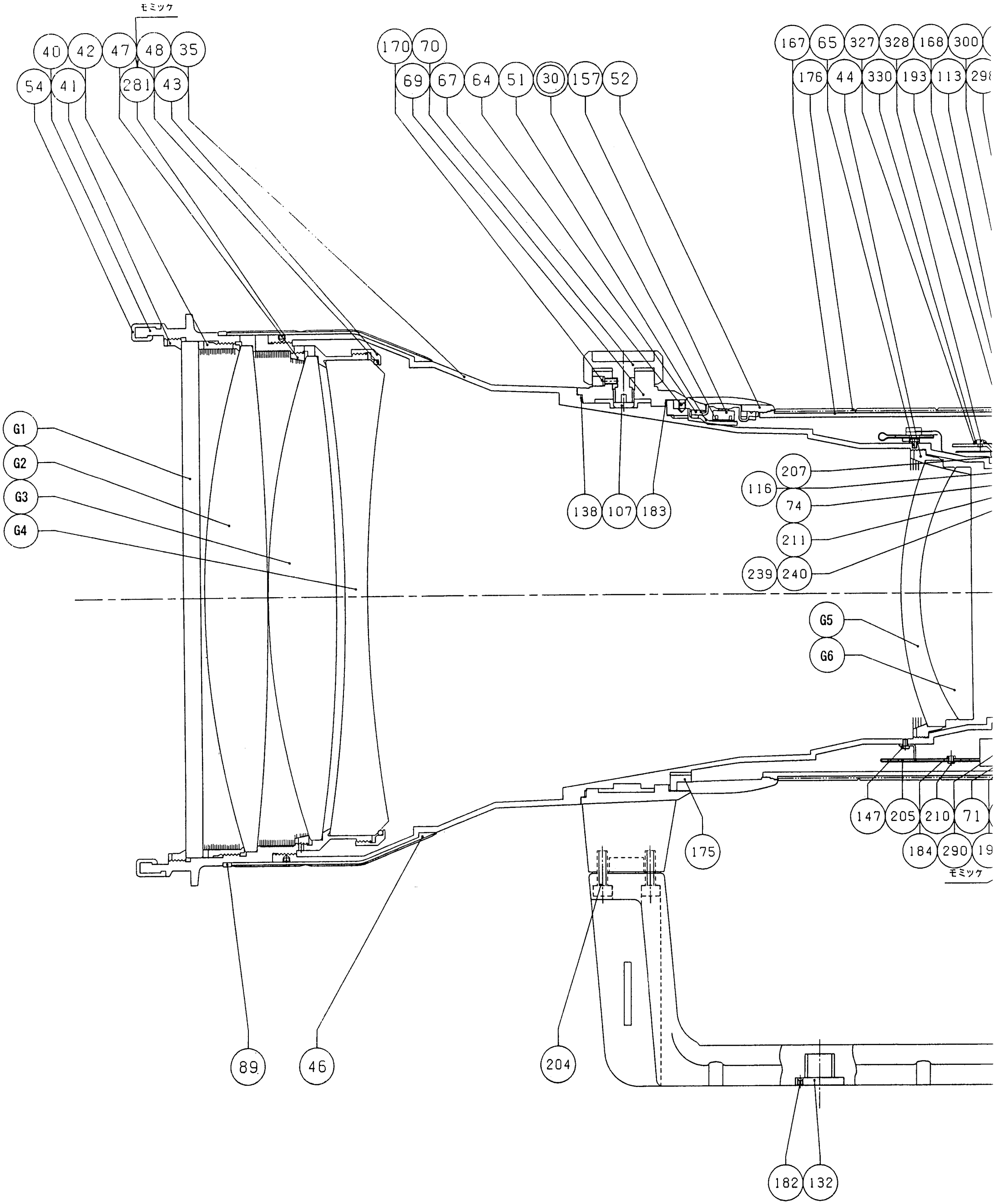
・Each 'value' explained here means the fixed value and the default value.
Of them, there are some changes according to the lens operational condition(s).

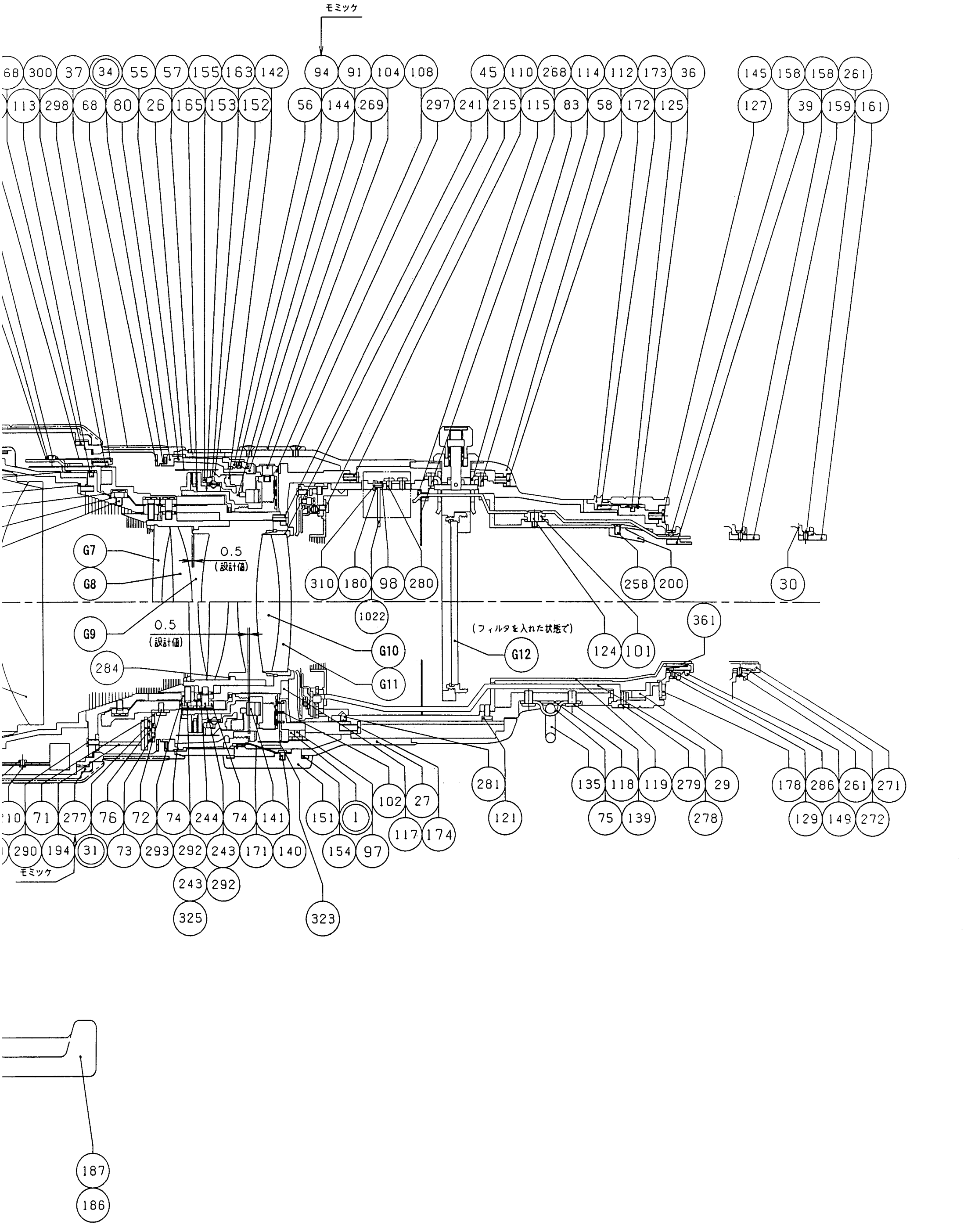
・The sign of 「－」 in the table above means a value which changes in accordance with the lens operational condition(s).

外観図 Sketch drawings

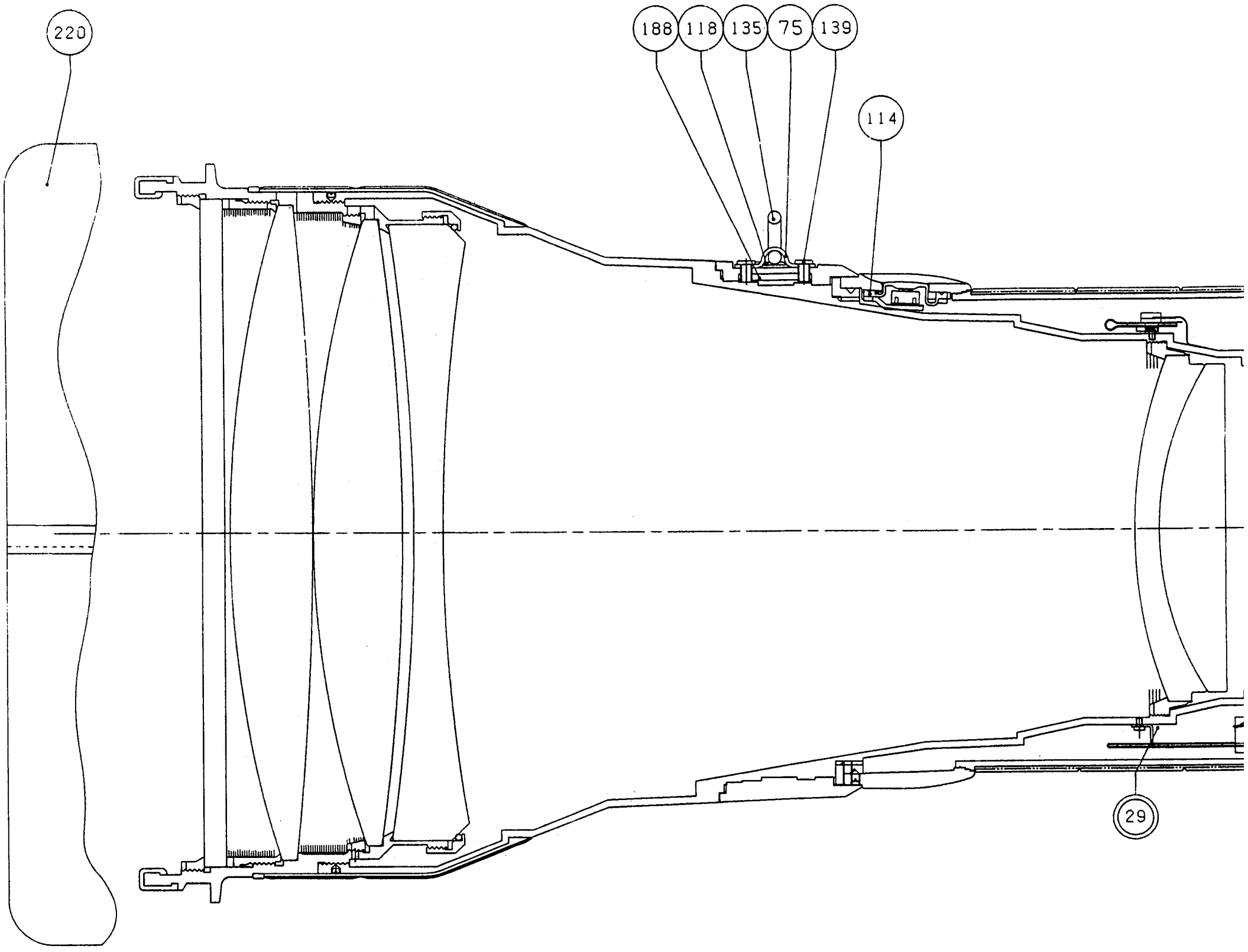


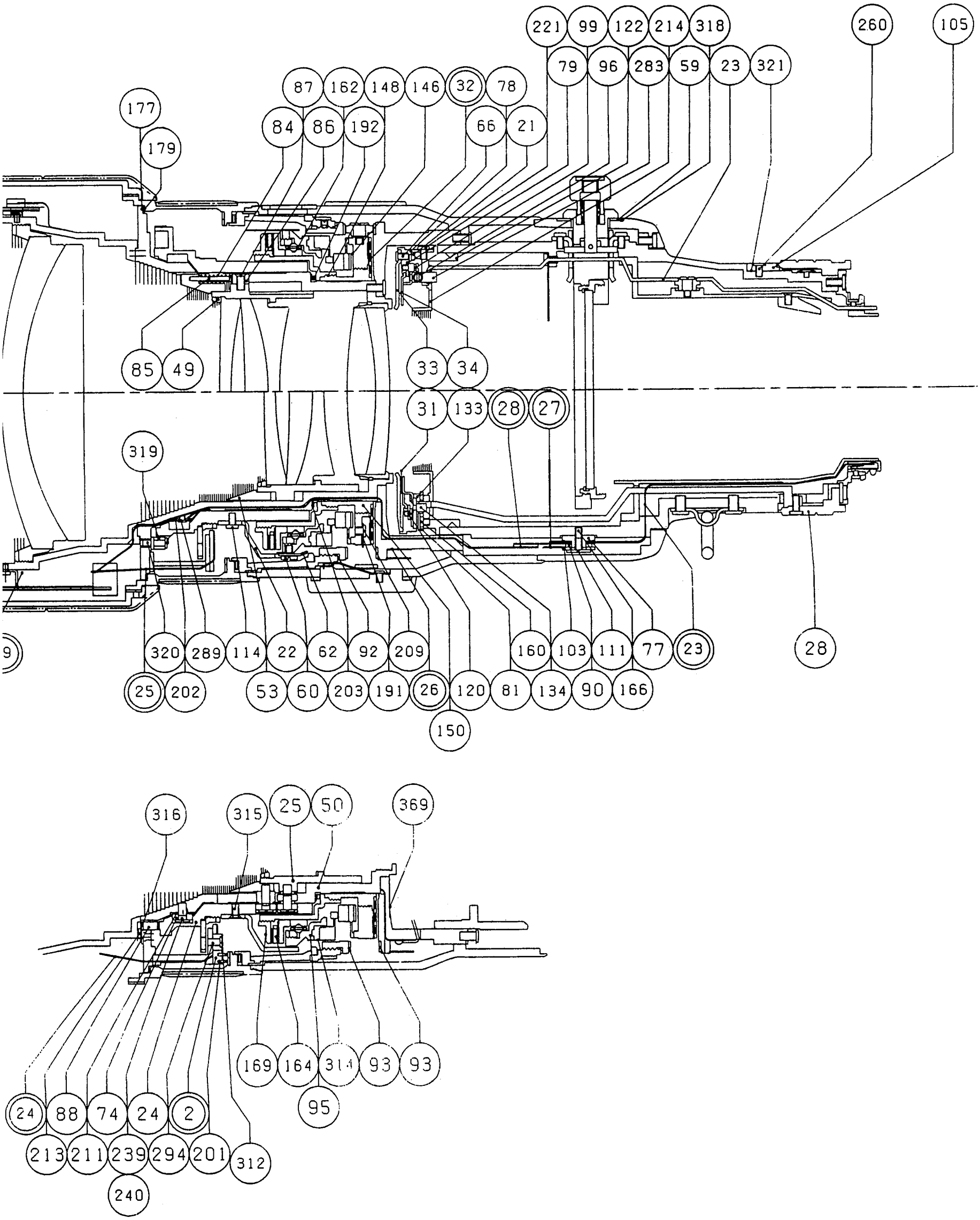
組立図 Structure of the Lens




モミッケ
68 300 37 34 55 57 155 163 142
94 91 104 108
45 110 268 114 112 173 36
145 158 158 261
113 298 68 80 26 165 153 152
56 144 269
297 241 215 115 83 58 172 125
127 39 159 161
G7
G8
0.5
(設計値)
310 180 98 280
258 200
30
1022
G9
0.5
(設計値)
G10
(フィルタを入れた状態で)
G12
361
124 101
284
G11
281
135 118 119 279 29
178 286 261 271
121
75 139 278
129 149 272
102 27
117 174
151 1
154 97
210 71 277 76 72 74 244 74 141
290 194 31 73 293 292 243 171 140
モミッケ
243 292
325
323
187
186

INC

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