

RESEARCH PHOTOMICROGRAPHIC MICROSCOPE SYSTEM

MODEL: AH3

REPAIR MANUAL

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OLYMPUS

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1. OUTLINE OF MERCHANDISE

AHBS3

This is the automatic type PHOTOMICROGRAPHIC AH3 body for biology designed for use in laboratories, which is remodeled from AH2 (AHBS) by widening the auto focus range.

AHBT3

This is the manual type PHOTOMICROGRAPHIC AH3 body for biology designed for use in laboratories, which is remodeled from AH2 (AHBT) by making the CONDENSER TURRET automatically interlocking with the objective magnification.

AHMT3

This is the UPRIGHT TYPE PHOTOMICROGRAPHIC AH3 body for metallurgy designed for use in laboratories, which is remodeled from AH2 (AHMT) by increasing the stage vertical mountable range 18mm to permit observation of a thick specimen.

2. FEATURES

AHBS3

- (1) Built-in photographing unit of the AVERAGE/SPOT METERING selectable type
- (2) Attachable with three cameras and one TV camera at same time
- (3) Auto focusing from low to middle magnification (objective 1X ~ 40X) (Auto focus features called AF)
- (4) Scale and data imprintable and photographing in half size
- (5) Single lens REFLEX FINDER
- (6) Motorized REVOLVING NOSEPIECE
- (7) Illumination systems such as condenser, field diaphragm, aperture diaphragm are all adjusted automatically, linked to each objective magnification.
- (8) Full KOHLER ILLUMINATION
- (9) Super wide field of view (FIELD NUMBER 26.5)
- (10) Four built-in photographic eyepieces (2.5×, 3.3×, 4×, 5×)
- (11) Built-in light balancing filter, ND filter and contrast filter
- (12) When the built-in lamp switch is turned off in observation of reflected light fluorescence (using AH3-RFCA), the condenser, AS and ND are not moved even if an objective is changed.
(This is the feature for the user who use the reflected light fluorescence only and does not use the transmitted light.)
- (13) This model (A2-AAC-2) has improvement against protection of self fluorescence light of A2-AAC in observation with the reflected light fluorescence

A. OUTLINE OF PRODUCT

• Table of compatibility between AH2 and AH3 (other microscope)

Unit	AHBS	AHBT	AHMT	AHBS3	AHBT3	AHMT3
A2-6RE2	* 1	* 1	* 1	* 1	* 1	* 1
A2-AAC2	* 4	* 4	* 4	* 4	* 4	—
A2-CHM	* 2,3,24	* 2,24	* 2,24	* 2,3,24	* 2,24	* 2
A2-TCS2	* 5	* 5,6,7	* 5,6,7	* 5	* 5,7	—
A2-TCT2	* 5,7	* 5,6,7	* 5,6,7	* 5,7	* 5,7	—
AH3-UMA	* 25,27	* 25,27	* 27,30	* 25,27	* 16,25,27	○
AH3-RFCA	* 26,28	* 28	* 28	○	○	* 29

*1 ~ 23 See the preceding page.

*24: Overlap with the guide dovetail decreases if attached with the fixing screw located top.

*25: Interferes with the stage when mounting the reflected light Nomarski prism.

*26: AF malfunction, different AS/FS initial setting, malfunction in magnification display, A2-TCS2 works with the lamp switch OFF.

*27: Ghost is seen when viewed from the oblique direction.

*28: Too much SELF FLUORESCENCE LIGHT (when using A2-AAC)

*29: Composite observation is impossible.

*30: No stage stroke increase

• Table of Sliders for each revolving nosepiece unit.

A2-6RE2

Slider	Transmitted NIC	Transmitted polarization	
AH2-AN45	—	○	AN
AH2-KPO	—	○	PO
AH2-NAS	○	—	NIC+AN
(A2-NA)			
AH2-NAS	○	—	NIC+PO
(A2-NS)			

AN: Analyzer
 PO: Polarizer
 NIC: Nomarski observation.

* Combination is the same as AH2.

* A2-NS is for SPlan.

AH3-RFCA

Slider	Transmitted NIC		Transmitted polarization	
	DPLAN	SPLAN		
AH3-ANF	○	○	○	AN
AH3-NAF	○	○	—	NIC
AH3-NSF	○	—	—	NIC+PO
AH2-NAS	—	○		NIC+PO
(A2-NS)				
AH2-KPO	—	—	○	PO

* AH3-NSF is for DPlan.

* AH3-ANF is used for AH3-UMA.

4. COMPATIBILITY

• Compatibility between AH2 and AH3 units

AH3 Unit	AHBS3	AHBT3	AHMT3
A2-BTL	* 1	* 1	* 1
A2-CH	* 2,3	* 2	* 2
A2-AAC	* 4	* 4	—
A2-TCS	* 5	* 5	—
A2-TCT	* 5,6,7	* 5,6,7	—
A2-AAS	* 8	—	—
A2-AST	* 8	* 8	—
A2-LS	* 10	* 10	* 10
A2-FIL	○	○	○
A2-MM	○	○	○
A2-CB	○	—	—
AH2-MA	* 11	○	○
AH2-RLA	* 11	* 12	○
AH2-RFL (RFA)	* 13	* 14	* 15
AH2-TFL (RFA)	* 13	* 14	—
AH2-SIC6R (L)	* 16,17	* 17	* 17
AH2-WHR	* 16,17	* 17	* 17
AH2-MH	* 16,17	* 17	* 17
AH2-LWCD	○	○	○
AH2-RS	○	○	—
AH2-LSRF	○	○	○
AH2-SLM	○	○	○
AH2-SLH	○	○	○
AH2-ADF	○	○	○
AH2-DL-2	○	○	○
AH2-SVR (L)	* 18	* 18	* 18
AH2-NA	* 9	* 9	—
AH2-NS	* 9	* 9	—
AH2-M-NIC	* 11,19	* 19	* 19
AH2-M-NICUL	* 11,19	* 19	* 19
AH2-N-NIC	* 11,20	* 20	* 20
AH2-AN-45	* 21	* 21	* 22
AH2-KPO	* 23	* 23	—
AH2-DCD	○	○	—
AH2-DCW	○	○	—
AH2-DCH	○	○	—
AH2-KDC	○	○	—
HAND SW-1	○	○	○

○: Compatible

*: Conditioned

-: Not mountable or not operable

*1 : FS centration of low power objective is not ensured. Δ

*2 : Stage squareness adjustment required Δ

*3 : AF standard position adjustment required Δ

*4 : FS/AS centration is not ensured due to inclination (adjust in pairs with CH) Δ

*5 : FS centration of 4X or less not

*6 : Manual operation Δ ensured Δ

*7 : A2-CS not mounted Δ

*8 : AS centration not ensured Δ

*9 : —

*10: Lamp centration not ensured Δ

*11: Specimen may be broken when taking correction data.

*12: Momentary malfunction during interlocking of the revolving nosepiece and Condenser

*13: AF impossible, parts related to the revolving nosepiece not operated, objective not displayed, stage speed indefinite.

*14: Condenser not interlocked with objective. Δ

*15: Transmitted light fluorescence is impossible

*16: Focusing part not durable Δ

*17: Not perpendicular to optical axis Δ

*18: Stage insert plate is not compatible due to partial defocusing Δ

*19: Possible if AH2-MA is used Δ

*20: Possible if AH2-RLA is used Δ

*21: Use a modified part inclined 3° when combining with AH2-KPO in transmitted SIMPLE POLARIZING. Δ

*22: Reflected light Nomarski Observation is possible by attaching to AH2-MA. Δ

*23: Use a modified part inclined 3° when combining with AH2-AN45 in transmitted simple polarizing. Δ

Note) "Δ" is the same condition as AH2.

A. OUTLINE OF PRODUCT

Stage: SVR, SVL

Unit: mm

Screw position	With Nomarski Prism		Without Nomarski Prism	
	Observable specimen thickness	Stage stroke of Y axis	Observable specimen thickness	Stage stroke of Y axis
①	0 ~ 2	50	0 ~ 20	50
②	0 ~ 20	50	17 ~ 38	50
③	19 ~ 40	46	37 ~ 58	46

Same as AH2

* At the position ③, when the stage is moved toward the depth direction, it interferes with the main body dovetail and the stage stroke is decreased about 4mm.

Stage: SIC6

Unit: mm

Screw position	With Nomarski Prism		Without Nomarski Prism	
	Observable specimen thickness	Stage stroke of Y axis	Observable specimen thickness	Stage stroke of Y axis
①	Not mountable		Not mountable	
②	0 ~ 2.5	150	0 ~ 20.5	150
③	1.5 ~ 19	150	19.5 ~ 37	150
	19 ~ 22.5	94	37 ~ 40.5	94

Same as AH2

* At the position ①, if the Nomarski prism is attached, it interferes with the stage, and impossible. (At the position ②, a thin specimen can be observed, and the position ① is unnecessary in SIC6.)

* At the position ③, when the stage is moved toward the depth direction, it interferes with the main body dovetail and the stage stroke is decreased.

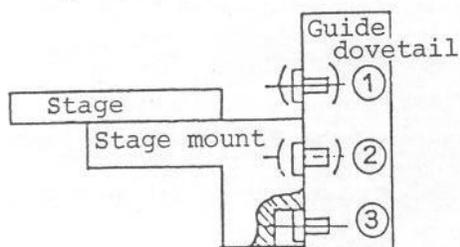
- (13) If the stage is set at lower position for observing a thick specimen, the stage rotation angle is decreased. (At combination of SVR and SVL) (The decreasing level differs for X and Y positions of the stage. The rotation angle in the worst condition is about 30°.)
- (14) If the stage is set lower, the stage handle is close to the base affecting maneuverability. (At combination of SVR and SVL)
- (15) When the halogen lamp other than the specified one is used, the following conditions are added. (Same as AH2)
 - ① The lamp optical axis may not be centered.
 - ② The lamp life time is not ensured.

A. OUTLINE OF PRODUCT

- (10) When the halogen lamp other than the specified one is used, the following conditions are added. (Same as AH2)
- 1 The lamp optical axis may not be centered.
 - 2 The lamp life time is not ensured.

AHMT3

- (1) Use the OBJECTIVE and EYEPIECE of the LB series.
- (2) Use C-35AD, C-35AD-2 or C-35AD-4 camera. The other 35mm cameras can not be used.
- (3) Allowable supply voltage fluctuation $\pm 10\%$ of the input voltage
- (4) Operating temperature: $0 \sim 40^{\circ}\text{C}$
- (5) Wait at least 3 seconds when turning on after it was turned off.
- (6) Transmitted light observation is possible only when AH2-LWCD attached to AH2-SIC6. In the standard combination of AH2-SVR and SVL, the LONG WORKING DISTANCE CONDENSER (AH2-LWCD) can not be attached and the transmitted light observation is impossible.
- (7) When setting stage to location other than three screw locations, noted below, fix stage securely to the dovetail of the main body.
- (8) The uppermost screw position (①) can not be used in with AH2-SIC6. (See the drawing below.)

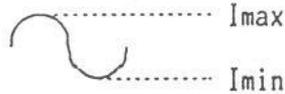


- (9) As the specimen load is increased, traceability becomes worse and the stage bending amount is increased. (Same level as the structure is the same as AH-2)
- (10) When the guide dovetail becomes 11mm or less from the top in the transmitted light illumination, the luminous flux is blurred. This is no problem in practical use. (Same level as AH-2)
- (11) A turret condenser (A2-TCS, A2-TCT, A2-TCS2, A2-TCT2) can not be attached.
- (12) If the stage is set lower than the middle screw position (②) (when observing a thick specimen), the stage stroke of Y axis is decreased.

A. OUTLINE OF PRODUCT

- Contrast 10% min. in AF sensor range

$$\text{Contrast} = (I_{\text{max}} - I_{\text{min}}) / (I_{\text{max}} + I_{\text{min}}) \times 100(\%)$$



- Pattern Not regular pattern
 - Color SPECTRAL CHARACTERISTICS 460 ~ 650nm
- (6) Wait for 30 minutes at least after the lamp is lit for photographing. (When the general magnification is 200X or bigger and exposure time is 10sec. or more)
 - (7) DPlanApo40xoilUV can not be used in the Nomarski observation with AH3-NSF. (Only dry type can be used.)
 - (8) For the compatibility of each unit, refer to No. A-8 Compatibility.
 - (9) When the objective of 40X is used, the slide glass may not be inserted in the still state.
 - (10) If the correction ring is extremely displaced, the AF may not work.
 - (11) Unless the specimen thickness is within 3μm in AF, the focus may not be adjusted on the target point.
 - (12) When the halogen lamp other than the specified one is used, the following conditions are added. (Same as AH2).
 - ① The lamp optical axis may not be centered.
 - ② The lamp life time is not ensured.

AHBT3

-
- (1) Use the OBJECTIVE and EYEPIECE of the LB series.
 - (2) Use C-35AD, C-35AD-2 or C-35AD-4 camera. The other 35mm cameras can not be used.
 - (3) Allowable supply voltage fluctuation ±10% of the input voltage
 - (4) Operating temperature: 0 ~ 40°C
 - (5) Wait at least 3 seconds when turning on after it was turned off.
 - (6) Condenser is not switched at a low magnification (1X ~ 4X) in the Nomarski observation with a transmitted light.
 - (7) Photograph release is ineffective during switching of the condenser, revolving nosepiece or camera optical path.
 - (8) Setting and operation of the condenser and revolving nosepiece are not accepted during photograph releasing.
 - (9) DPlanApo40xoilUV can not be used in the Nomarski observation with AH3-NSF. (Only dry type can be used.)

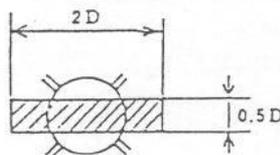
- (5) Super wide field of view (Field Number 26.5mm)
- (6) Four built-in photographic eyepieces (2.5×, 3.3×, 4×, 5×)
- (7) Built-in light balancing filter, ND filter
- (8) Provided with the inter-pupillary distance adjustment knob
- (9) Specimen of thickness up to 58mm can be observed.
(Without changing the vertical stroke of 21mm)
Specimen of thickness up to 40mm can be observed when using
the reflected light Nomarski observation. (When AH2-SIC6
is used, specimen of thickness up to 22mm is same as AH2)

3. USING CONDITIONS

AHBS3

- (1) Use the OBJECTIVE and EYEPIECE of the LB series.
- (2) Use C-35AD-2 or C-35AD-4 camera. The other 35mm cameras can not be used.
- (3) Operating conditions
 - Temperature: 0 ~ 40°C
 - Humidity: 30 ~ 85%
- (4) Allowable supply voltage fluctuation
 - ±10% of input voltage
- (5) AF (Auto Focus)
 - ① TRANSMITTED LIGHT BRIGHT FIELD ILLUMINATION FOR BIOLOGICAL is only permitted.
 - ② AF applicable objectives SPlan 1X ~ 40X
SPlanApo 1X ~ 40X

- ③ AF sensor range
Hatched area of the drawing on the right



D = Reticule circle diameter

- ④ Specimen
 - Slide glass thickness 0.8 ~ 1.4mm
 - Minimum specimen size

1X	20μm
2X	10μm
4X	5μm
10X	2μm
20X	1.0μm
40X	0.5μm
 - TRANSMITTANCE 3% min. in AF sensor range
Transmittance = (EMERGENT LIGHT / INCIDENT LIGHT) × 100(%)

- (14) Difference from AHBS (comparing with AHBS ...)
- * A2-TCS position indication screw is eliminated. (A2-TCS2)
 - * A2-BLT CT hole and its cover are eliminated. (A2-6RE2[6RED])
 - * Line voltage selector switch is eliminated. (AHBS3-F)
 - * Applicable to install AH3-RS232C (AHBS3-F)
 When connecting AH3-RS232C to AHBS, it is necessary to replace the built-in ROM of AHBS with ROM of AHBS3 (option)
 When connecting AH2-GPIB-2 to AHBS3, it is also necessary to replace the built-in ROM of AHBS3 with ROM of AHBS (option)
 In either case, the ROM can not be replaced by the user.

 AHBT3

- (1) Built-in auto exposure photographing unit of the 30% AVERAGE/1% SPOT METERING selectable type
- (2) Attachable with three cameras and one TV camera at same time
- (3) Scale and data imprintable and photographing in half size
- (4) Motorized REVOLVING NOSEPIECE
- (5) Super wide field of view (Field Number 26.5mm)
- (6) Four built-in photographic eyepieces (2.5x, 3.3x, 4x, 5x)
- (7) BUILT-IN LIGHT BALANCING FILTER, ND filter
- (8) Provided with the inter-pupillary distance adjustment knob
- (9) Condenser is switched automatically according to the objective magnification. Applicable revolving nosepieces are A2-6RE2 (A2-BTL) and AH3-RFCA. When the condenser is manually switched, the objective does not moved with it.
- (10) When the built-in lamp switch is turned off in observation with reflected light fluorescence (using AH3-RFCA), the condenser is not switched even if an objective is changed. (This is the feature for the user who use the reflected light fluorescence only and does not use the transmitted light.)
- (11) The data setting position of the objective and condenser is stored even if the main switch is turned off.
- (12) This model (A2-AAC-2) has improvement against protection of self fluorescence light of A2-AAC in observation with the reflected light fluorescence

 AHMT3

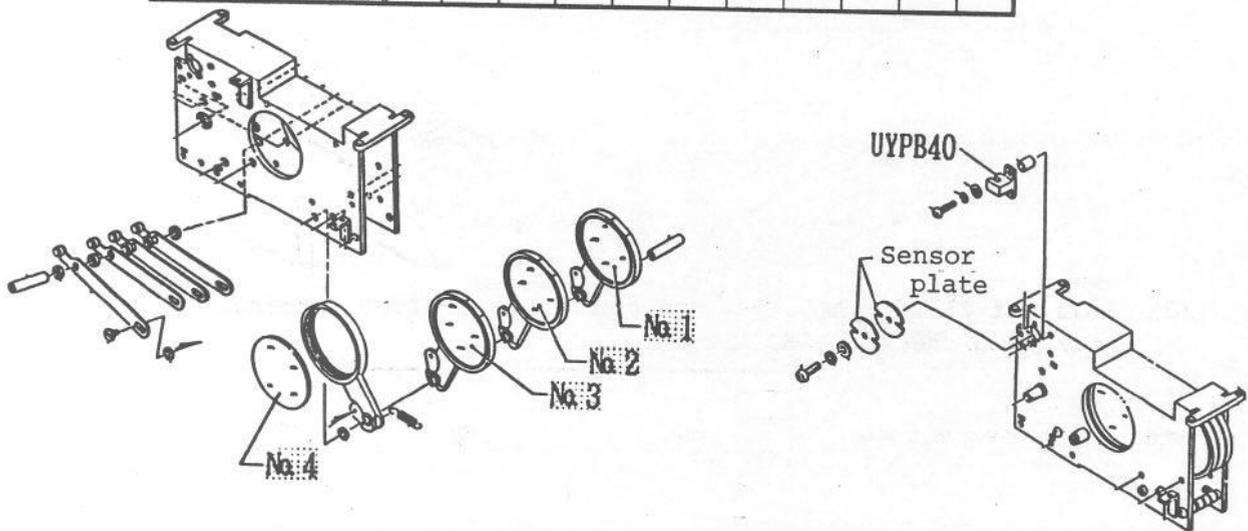
- (1) Built-in auto exposure photographing unit of the 30% AVERAGE/1% SPOT METERING selectable type
- (2) Attachable with three cameras and one TV camera at same time
- (3) Scale and data imprintable and photographing in half size
- (4) Motorized revolving nosepiece

B. REPAIR PROCEDURE

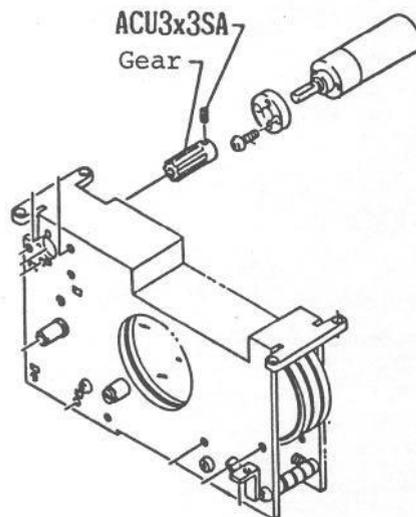
- (8) The STOP LED of the operation checker should be lit at each stop position. Otherwise, adjust so that the sensor plate notch center coincides with UYPB40 sensor center.
- (9) Verify that the sensor LED of the operation checker is lit as shown in the table below at each stop position.

Sensor LED		0	1	2	3	4	5	6	7	8	9	A
Filter	No. 1	×	○	×	○	○	○	○	○	○	×	○
	No. 2	×	×	○	○	×	×	○	○	×	○	○
	No. 3	×	×	×	×	○	×	○	×	○	○	○
	No. 4	×	×	×	×	×	○	×	○	○	○	○

○ = IN
 × = OUT



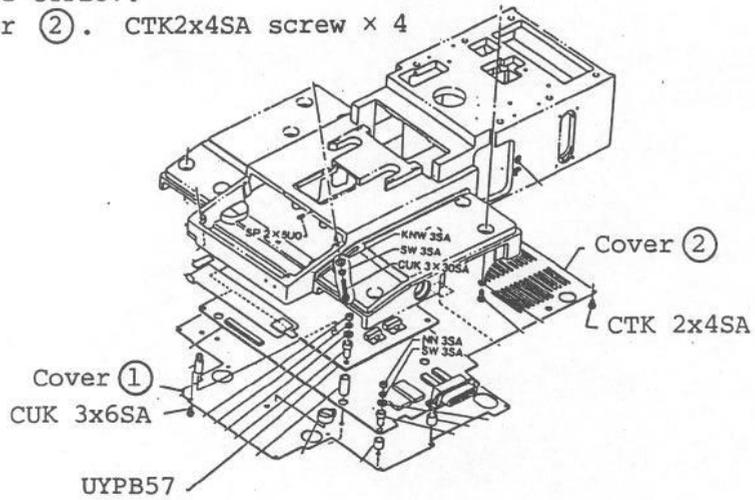
In case of defect, loosen the screw ACU × 3SA and turn the gear.



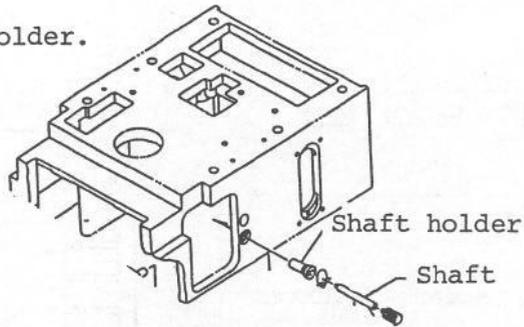
B. REPAIR PROCEDURE

1-4 Adjustment of ND filter unit sensor position

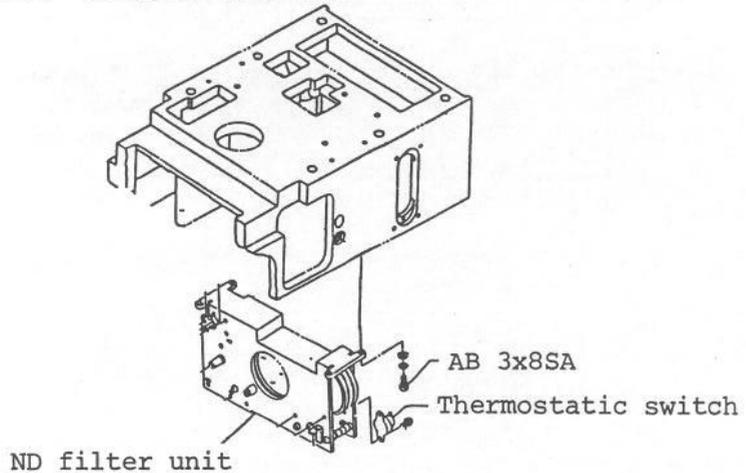
- (1) Remove the cover ①. CUK3x6SA screw × 10
- (2) Pull out J103 of UYPB57.
- (3) Remove the cover ②. CTK2x4SA screw × 4



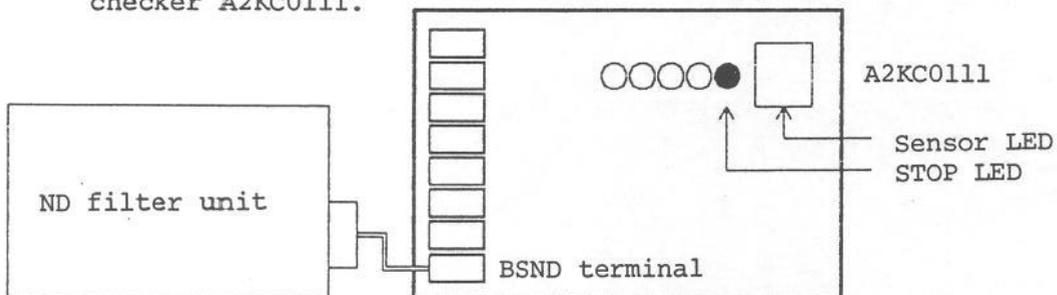
- (4) Remove the shaft and shaft holder.



- (5) Disconnect the two cables from the thermostatic switch.
- (6) Remove the ND filter unit. AB3x8SA screw × 4



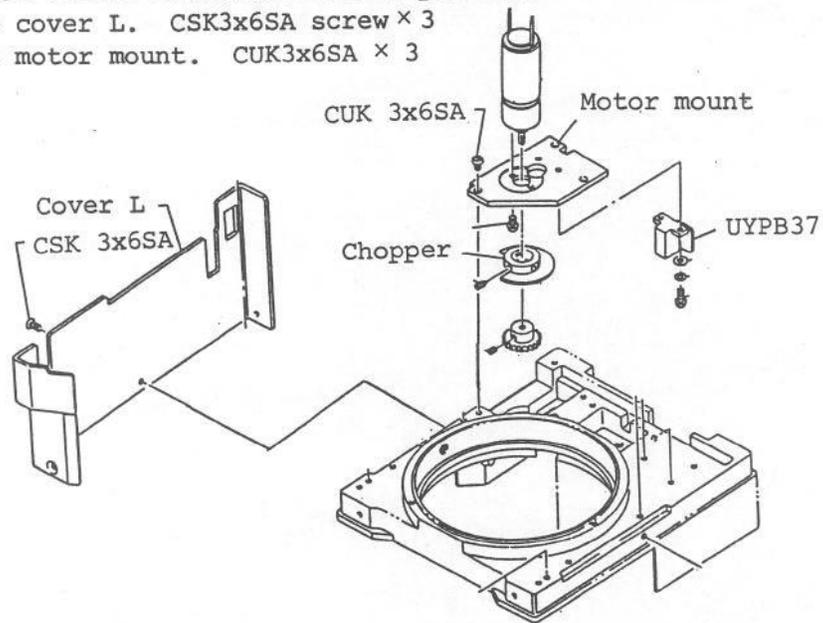
- (7) Connect the ND filter unit to BSND terminal of the operation checker A2KC0111.



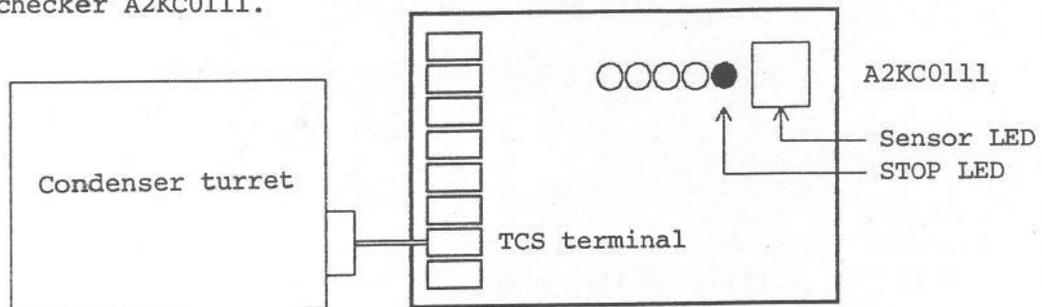
B. REPAIR PROCEDURE

1-3 Adjustment of turret condenser sensor position

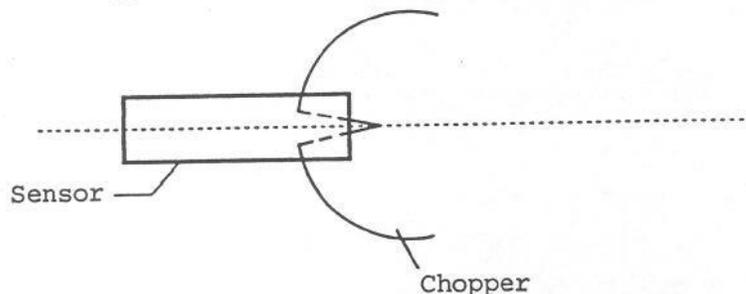
- (1) Remove the cover L. CSK3x6SA screw × 3
- (2) Remove the motor mount. CUK3x6SA × 3



- (3) Connect the condenser turret to TCS terminal of the operation checker A2KC0111.



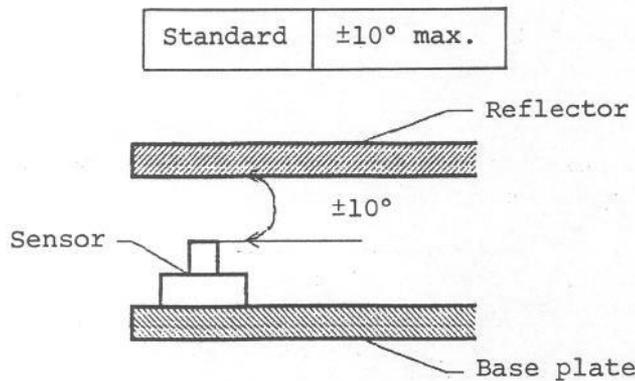
- (4) Turn on the operation checker. (* Leave the motor SW OFF.)
 - (5) Rotate the turret condenser by hand to set it to the click position.
 - (6) Adjust the chopper position so that the stop and sensor LEDs of the operation checker are lit.
- * Adjust the chopper notch center to the UYPB37 sensor center.



- (7) Turn on the motor SW of the operation checker, and press the forward/backward switch of the motor to rotate the turret condenser. Verify that the stop LED of the operation checker should be lit at each click position and the sensor LED is lit for 0 ~ 2.

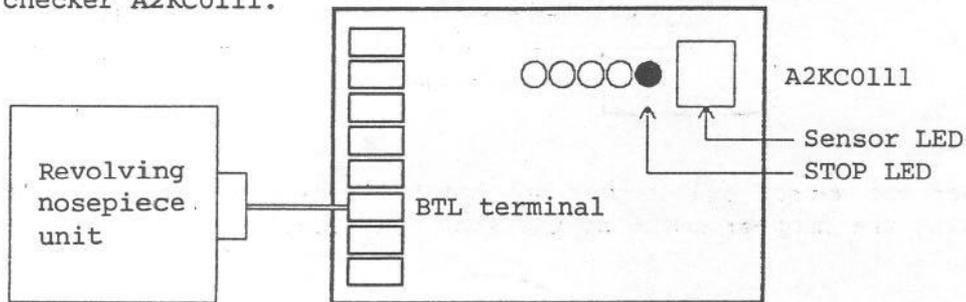
B. REPAIR PROCEDURE

- ② Adjust so that the inclination of the reflector to the sensor meets the following standard.

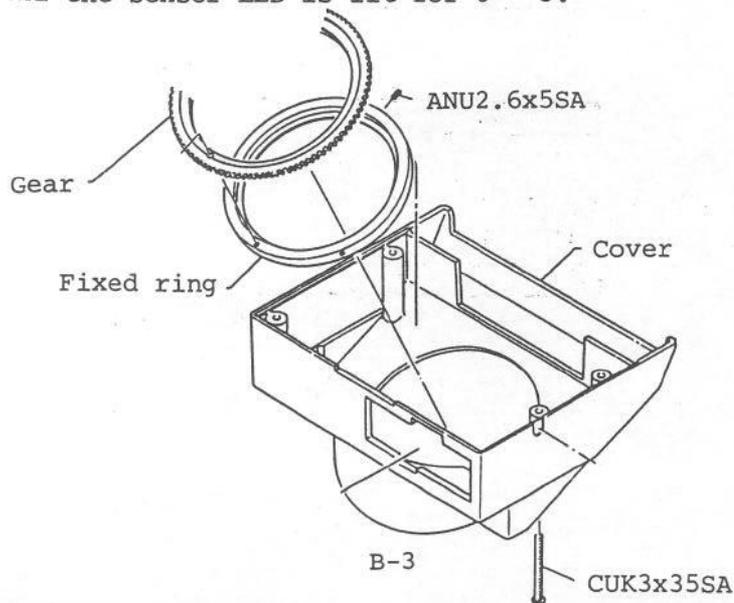


1-2 Adjustment of revolving nosepiece unit sensor position

- (1) Remove the cover. CUK3x35SA screw × 4
- (2) Connect the revolving nosepiece unit to BTL terminal of the operation checker A2KC0111.



- (3) Turn on the operation checker. (* Leave the motor SW OFF.)
- (4) Rotate the revolving nosepiece by hand to set it to the click position.
- (5) Loosen the three ANU2.6x5SA screws of the fixed ring.
- (6) Rotate the revolving nosepiece gear by hand and stop it at the position where the sensor and stop LEDs of the operation checker are lit.
- * The LEDs should be lit within the gear notch when swinging the gear. Otherwise, the stop position will be wrong. Set the gear to the position where the LEDs do not go out.
- (7) Tighten the three ANU2.6x5SA screws of the fixed ring, and apply Shellac (OT1131) to the screw heads.
- (8) Turn on the motor SW of the operation checker, and press the forward/backward switch of the motor to rotate the revolving nosepiece. Verify that the stop LED of the operation checker should be lit at each click position and the sensor LED is lit for 0 ~ 5.



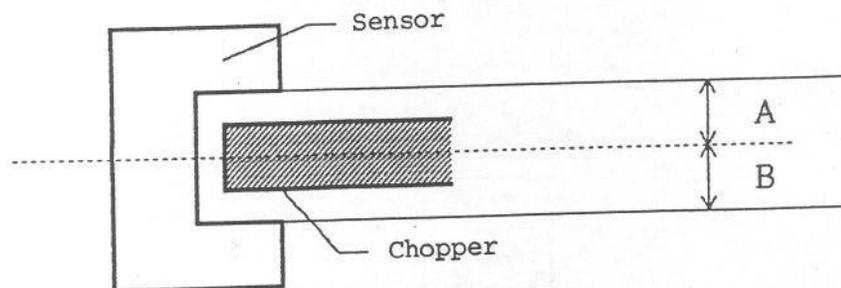
1. ADJUSTMENT OF SENSOR POSITION

1-1 Standard sensor position

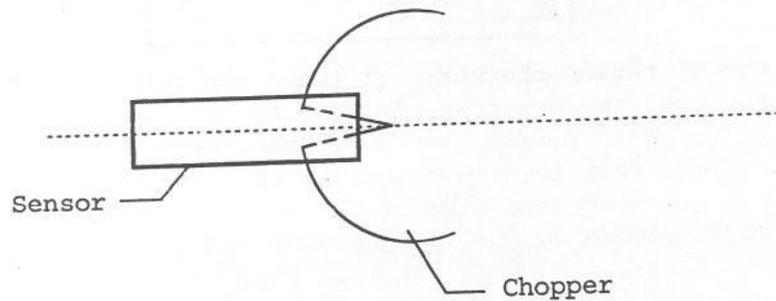
(1) Transmission sensor

- ① Light should pass through the center of the transmission sensor when the chopper functions.

Standard	$A \approx B (\pm 0.5\text{mm})$
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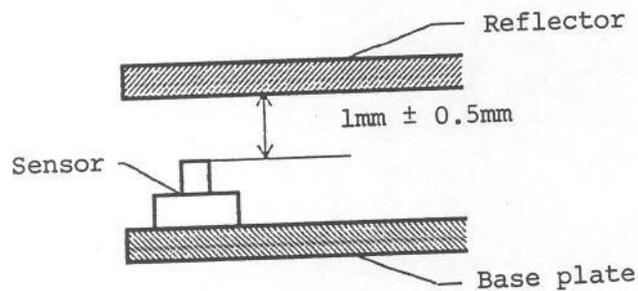
- ② Set the sensor and chopper so that the sensor center coincide with the chopper notch at the stop position.



(2) Reflection sensor

- ① Adjust so that the distance from the reflector to the top of sensor meets the following standard.

Standard	$1\text{mm} \pm 0.5\text{mm}$
----------	-------------------------------



7. ADJUSTMENT OF FIELD DIAPHRAGM (FS)

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AHBS3

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AHBT3, AHMT3

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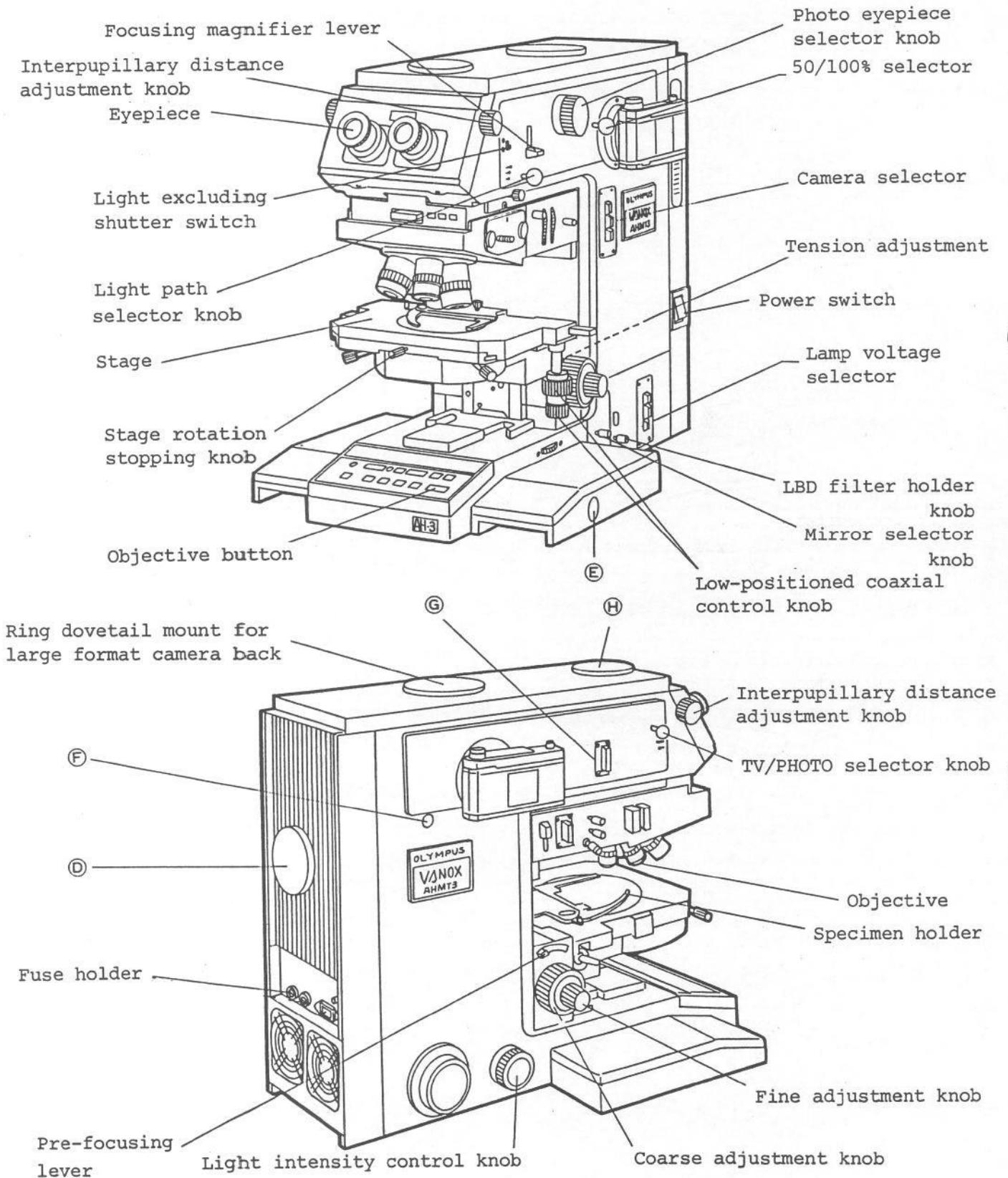
5. POWER SUPPLY UNIT ADJUSTMENT

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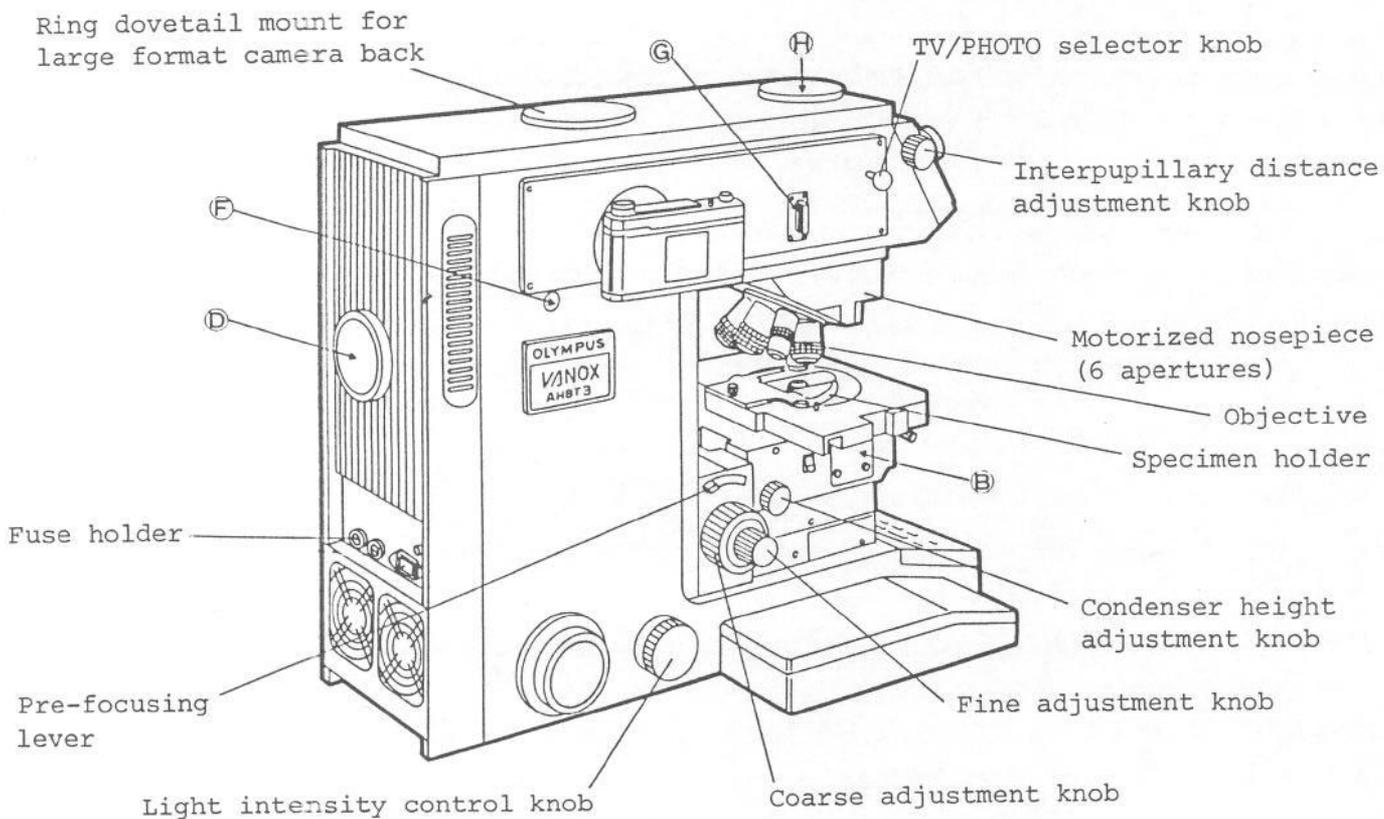
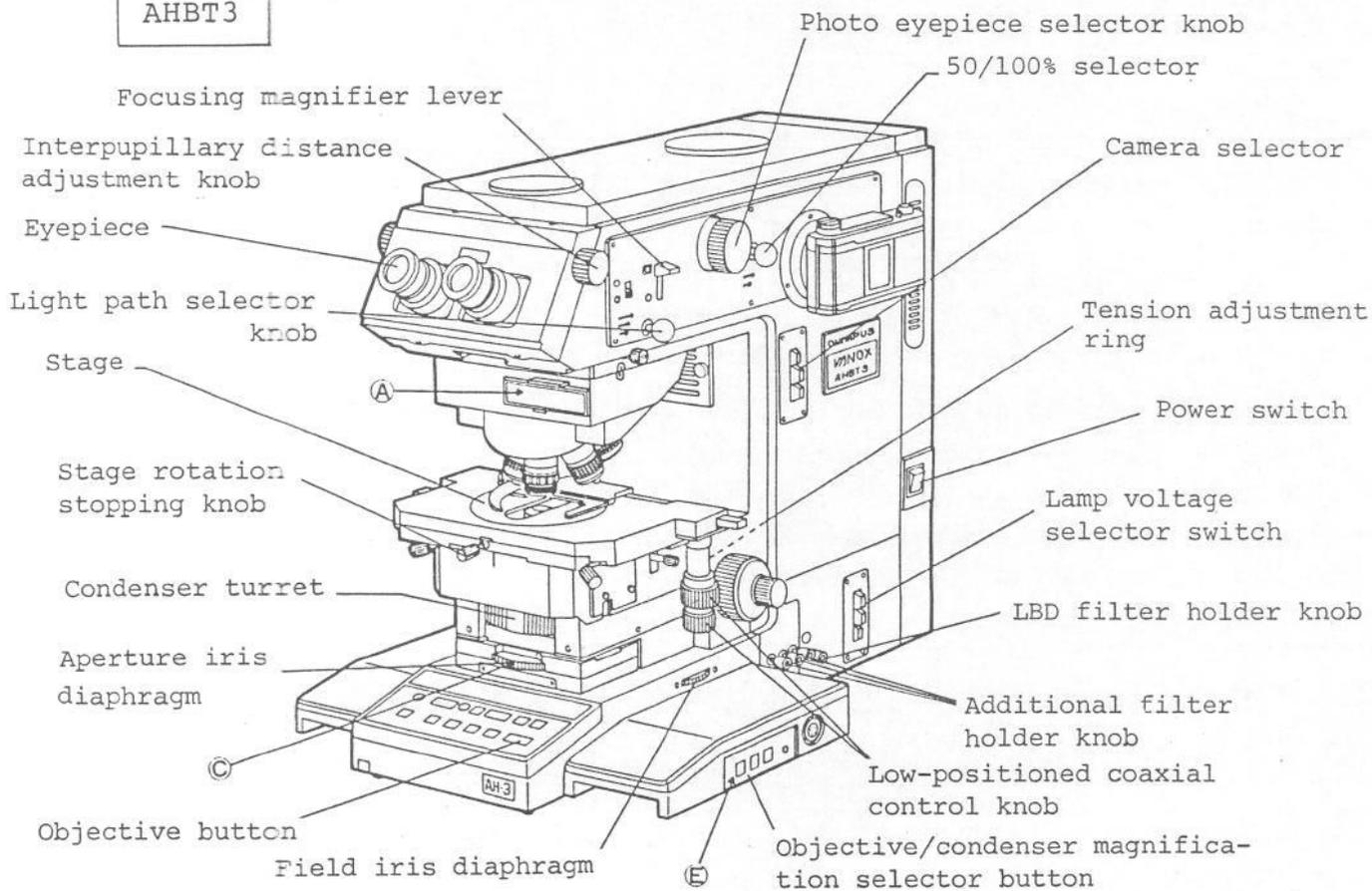
6. ADJUSTMENT OF APERTURE DIAPHRAGM (AS)

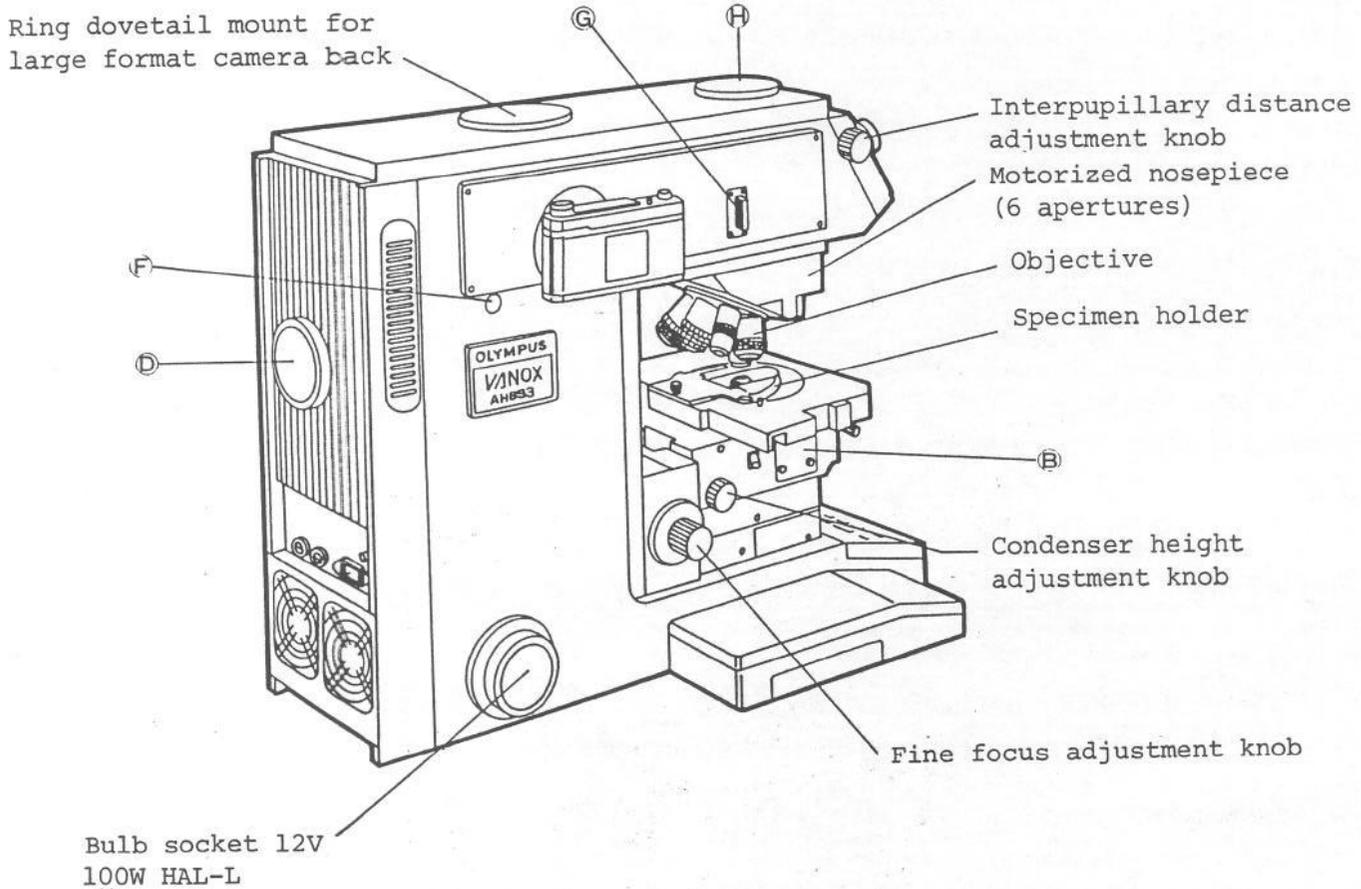
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AHMT3



AHBT3



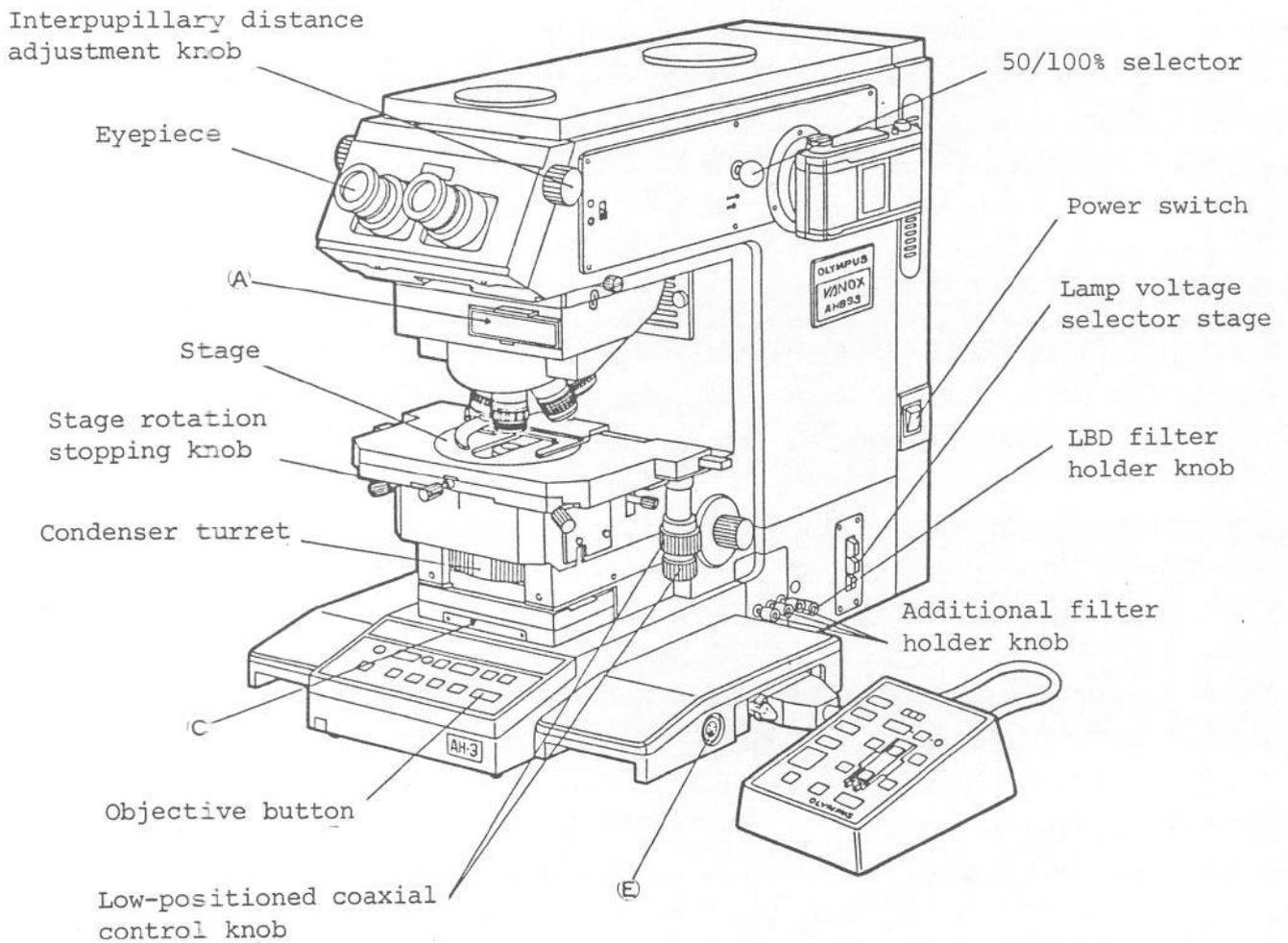


Ⓐ through ⓓ for various attachments:

- Ⓐ Differential interference contrast attachment/analyzer
- Ⓑ Differential interference contrast attachment/polarizer/darkfield condenser
- Ⓒ Light annulus for phase contrast
- Ⓓ Mercury burner/Xenon light sources
- Ⓔ Jack for attachment of optional hand switch
- Ⓕ X synchr. contact (for Olympus Recordata back)
- Ⓖ Focusing glass/half-size frame exposure slider
- Ⓗ TV/light measurement port

6. IDENTIFICATION OF VARIOUS COMPONENTS

AHBS3



A. OUTLINE OF PRODUCT

Item	Specification	Remarks
9	Photographing unit 1) Auto exposure mechanism provided Auto exposure range 1/100sec ~ 99.9H 2) ISO/ASA setting range 6 ~ 6400 3) Exposure compensation to meet the specimen distribution state 4) Electrical switching of 30% average measurement/1% spot measurement 5) Exposure alarm (display) (1) Safety/under/over (2) Shutter operation (3) Real time exposure measurement (4) Spot measurement (5) Expected exposure time 6) RECIPROCITY FAILURE COMPENSATION 7) Previous exposure time callable 8) Double exposure, exposure time locked 9) Auto wind-up mechanism	
10	Eye point height	434.5mm from the desk surface
11	Size (mm)	380(W) × 590(D) × 490(H)
12	Weight	35kg (with C-35AD-4 × 2)
13	Power consumption	• 100/120V system 450VA max. • 220/240V system 440VA max.

A. OUTLINE OF PRODUCT

Item	Specification	Remarks
2	Magnification conversion 1) Neo objective 5-hole motorized revolving nosepiece 2) Photo eyepiece 2.5X/3.3X/4X/5X manual turret magnification change 3) General magnification Observation 15X ~ 1500X Photography 3.75X ~ 750X (35mm) 11.25X ~ 2250X (large format) [Objective of 150X is used for 1500X in observation and 750X(35mm) and 2250X (large format), but the resolution is almost the same as 100X.]	
3	Light source 1) 12V/100W long life halogen lamp (precenter type)(2000H) JAPAN PHILIPS TYPE 77241 (12V-100W) 2) 150W xenon lamp (option) 3) 200W mercury lamp (option)	
4	Stage 1) Lower right coaxial handle large stage 2) Stage rotation centering permitted 3) Stroke X: 76mm Y: 50mm Stage rotation range and stroke differ according to the stage mounting position. 4) 6 inch stage is available (option)	Refer to the using conditions (13) and (14). AH2-SIC-6R
5	Focusing Low magnification: Manual with the built-in focusing telescope High magnification: Manual	
6	Illumination system 1) APERTURE DIAPHRAGM: Manual switching 2) FIELD DIAPHRAGM: Manual switching 3) Light intensity adjustment: Manual switching	* Possible in AH3-UMA
7	Filter LIGHT BALANCING FILTER (daylight/tungsten), ND filter, built in	
8	Camera 1) Two 35mm camera, one large format camera and one TV camera mount mountable (4 cameras at same time). 2) Electrical switching of camera optical path 3) Half frame slider is provided for photograph (option)	AH2-SLH

Item		Specification	Remarks
8	Camera	1) Two 35mm camera, one large format camera and one TV camera mount mountable (4 cameras at same time). 2) Electrical switching of camera optical path 3) Half frame slider is provided for photograph (option).	AH2-LSH
9	Photographing unit	1) Auto exposure mechanism provided Auto exposure range 1/100sec ~ 99.9H 2) ISO/ASA setting range 6 ~ 6400 3) Exposure compensation to meet the specimen distribution state 4) Electrical switching of 30% average measurement /1% spot measurement 5) Exposure alarm (display) (1) Safety/under/over (2) Shutter operation (3) Real time exposure measurement (4) Spot measurement (5) Expected exposure time 6) Reciprocity failure compensation 7) Previous exposure time callable 8) Double exposure, exposure time locked 9) Auto wind-up mechanism	
10	Eye point height	434.5mm from the desk surface	
11	Size (mm)	380(W) × 590(D) × 490(H)	
12	Weight	35kg (with C-35AD-4 × 2)	
13	Power consumption	• 100/120V system 450VA max. • 220/240V system 440VA max.	

AHMT3

Item		Specification	Remarks
1	Observation tube	1) Tube inclination 30° 2) Inter-pupillary adjustment range 56 ~ 75mm 3) Diopter adjustment range -8 ~ +2 diopt 4) Super wide field eyepiece (field number 26.5), (standard) 5) Ordinary field eyepiece (field number 20), (option) 6) Constant tube length adjustment	Adjustment knob mechanism is provided

AHBT3

Item		Specification	Remarks
1	Observation tube	1) Tube inclination 30° 2) Inter-pupillary adjustment range 56 ~ 75mm 3) Diopter adjustment range -8 ~ +2 diopt 4) Super wide field eyepiece (field number 26.5), (standard) 5) Ordinary field eyepiece (field number 20), (option) 6) CONSTANT TUBE LENGTH ADJUSTMENT	Adjustment knob mechanism is provided.
2	Magnification conversion	1) 6-hole motorized revolving nosepiece 2) Photo eyepiece 2.5X/3.3X/4X/5X manual turret magnification change 3) General magnification Observation 10X ~ 1000X Photography 2.5X ~ 500X (35mm) 7.5X ~ 1500X (large format)	
3	Light source	1) 12V/100W long life halogen lamp (2000H) 2) Precenter system	
4	Stage	1) Lower right coaxial handle large stage 2) Stage rotation centering permitted 3) Stroke X: 76mm Y: 50mm	
5	Focusing	Low magnification: Manual with the built-in focusing telescope High magnification: Manual	
6	Illumination system	1) 3-step Kohler illumination interlocking with the objective magnification . 1X ~ 4X . 10X ~ 20X . 40X ~ 100X 2) APERTURE DIAPHRAGM: Manual switching 3) FIELD DIAPHRAGM: Manual switching 4) Light intensity adjustment: Manual adjustment	
7	Filter	LIGHT BALANCING FILTER (daylight/tungsten), ND filter,	

A. OUTLINE OF PRODUCT

Item	Specification	Remarks
5	Illumination system 1) 3-step Kohler illumination 2) Auto brightness adjustment interlocking with magnification change 3) APERTURE DIAPHRAGM Changed automatically at changing magnification 4) FIELD DIAPHRAGM Changed automatically at changing magnification	Manual change is also possible. Manual change is also possible. Manual change is also possible.
6	Filter Light balancing filter (daylight/tungsten) ND filter built in	
7	Camera 1) Two 35mm cameras, one large format camera and one TV camera mountable (4 cameras at same time). Electrical switching of optical path 2) Photographing in half size (option).	AH2-SLH
8	Photographing unit 1) Auto exposure mechanism provided Auto exposure range 1/100sec ~ 99.9H 2) ISO/ASA setting range 6 ~ 6400 3) Exposure compensation to meet the specimen distribution state 4) Electrical switching of 30% average measurement/1% spot measurement 5) Exposure alarm (display) (1) Safety/under/over (2) Shutter operation (3) Real time exposure measurement (4) Spot measurement (5) Expected exposure time 6) RECIPROCITY FAILURE COMPENSATION 7) Previous exposure time callable 8) Double exposure, exposure time locked 9) Auto wind-up mechanism 10) Light excluding SHUTTER	
9	Eye point height 434.5mm from the desk surface	
10	Size (mm) 380(W) × 590(D) × 490(H)	
11	Weight 3.5kg (with C-35AD-2 or C-35AD-4 × 2)	
12	Power consumption • 100/120V system 450VA max. • 220/240V system 440VA max.	

AH3-UMA

Slider	Reflected NIC	Reflected polarization	
AH3-UAN	○	○	AN
AH3-UPO	NIC side	PO side	PO
AH3-UTP530	○	—	λ

AN: Analyzer
 PO: Polarizer
 λ : TINT PLATE

- * Analyzer is selectable from AH3-UAN (fixed polarizing plate type) and AH3-ANF (rotary polarizing plate type).
- * Polarizer is selectable in front side and back side.
- * Nomarski prism is used for U-NIC series.

5. SPECIFICATIONS

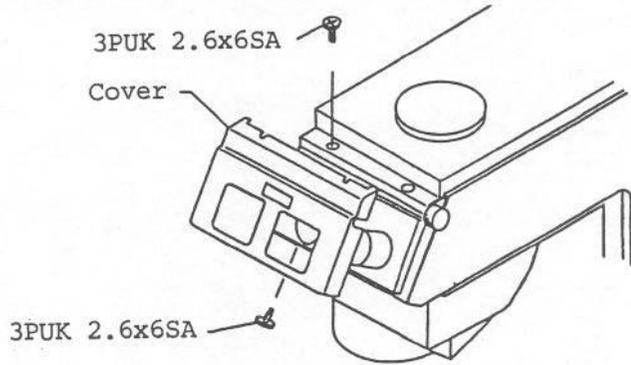
AHBS3

Item	Specification	Remarks
1 Observation tube	1) TUBE INCLINATION 30° 2) Inter-pupillary adjustment range 56 ~ 75mm 3) Diopter adjustment range -8 ~ +2 diopt 4) FIELD NUMBER 26.5 5) CONSTANT TUBE LENGTH ADJUSTMENT	Adjustment knob mechanism is provided.
2 Magnification conversion	1) 6-hole motorized revolving nosepiece 2) Photo eyepiece 2.5X/3.3X/4X/5X motorized turret magnification change 3) General magnification Observation 10X ~ 1000X Photography 2.5X ~ 500X (35mm) 7.5X ~ 1500X (large format)	
3 Focusing	1) Bright field observation Auto focus permitted with an objective 1 ~ 40X 2) Others Manual adjustment by control box. Possible also with the fine adjustment handle.	Up/down stroke 8mm
4 Light source	1) 12V/100W long life halogen lamp (2000H) 2) Precenter system	

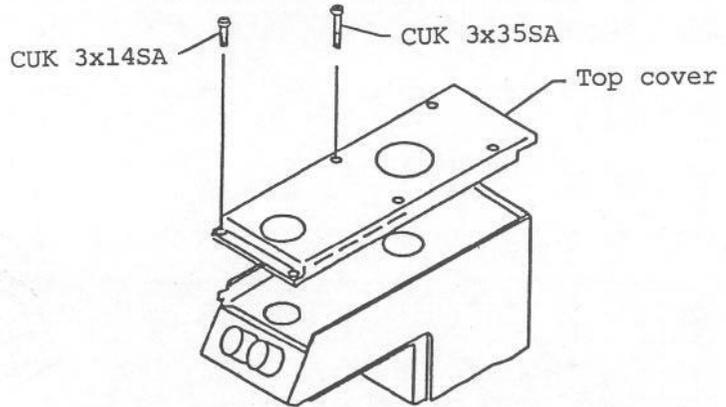
B. REPAIR PROCEDURE

1-6 Adjustment of 3-step selector sensor position

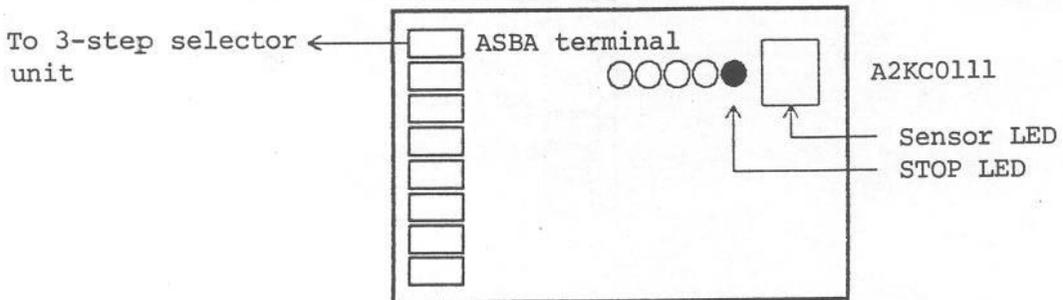
- (1) Remove the cover.
 3PUK2.6x6SA screw × 4



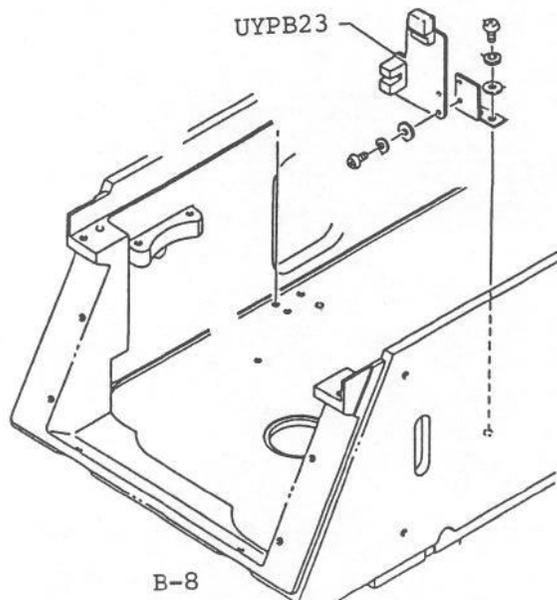
- (2) Remove the top cover.
 CUK3x14SA screw × 2
 CUK3x35SA screw × 4



- (3) Pull out J105 of A0521900 and connect it to ASBA terminal of the operation checker A2KC0111.



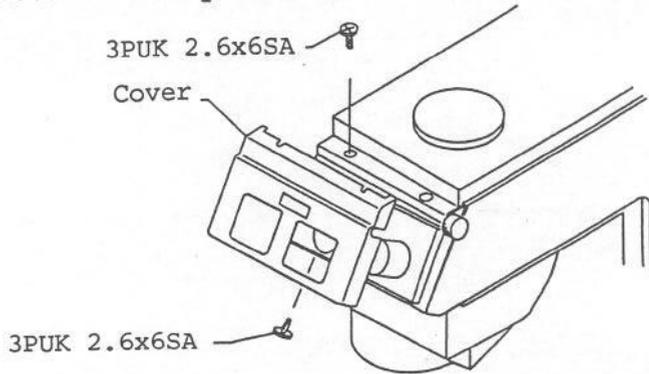
- (4) Adjust the UYPB23 position so that the stop and sensor LEDs of the operation checker are lit at each click position.



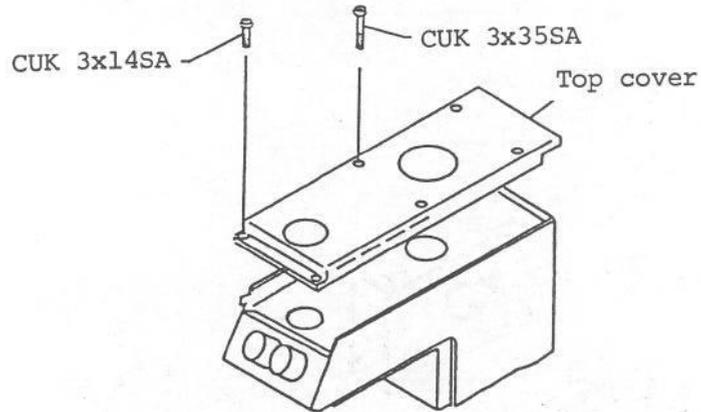
B. REPAIR PROCEDURE

1-5 Adjustment of 2-step selector sensor position

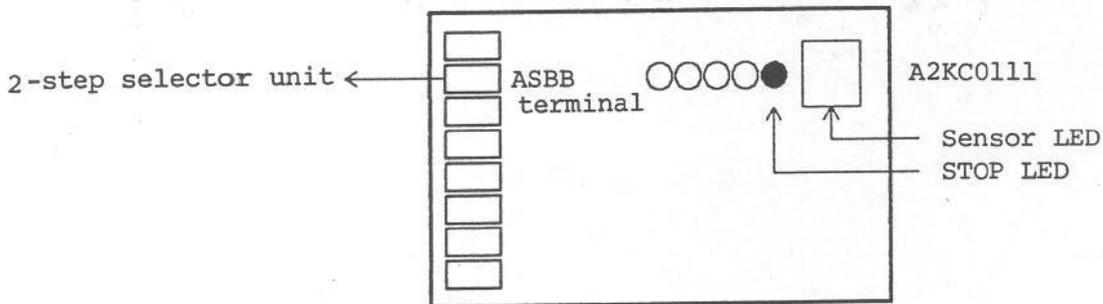
- (1) Remove the cover.
3PUK2.6x6SA screw × 4



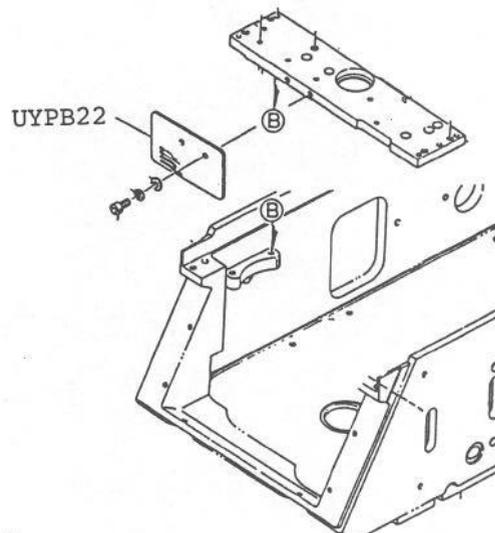
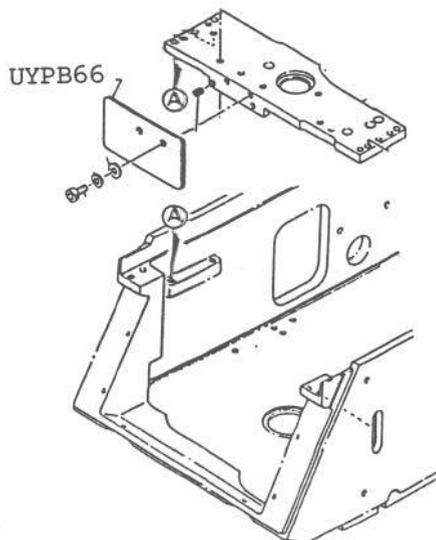
- (2) Remove the top cover.
CUK3x14SA screw × 2
CUK3x35SA screw × 4



- (3) Pull out J106 of A0521900 and connect it to ASBB terminal of the operation checker A2KC0111.



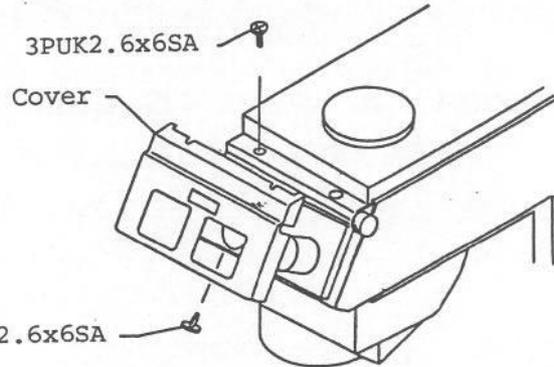
- (4) The stop and sensor LEDs of the operation checker should not be off at each click position. If the LEDs are off, change the positions of UYPB66 (AHBS3) or UYPB22 (AHBT3/AHMT3).



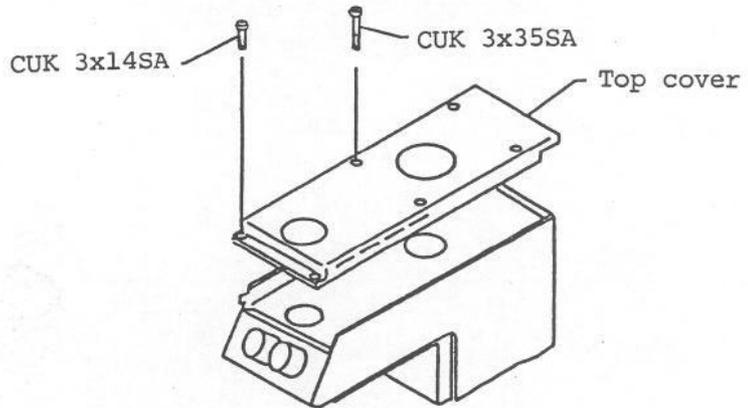
B. REPAIR PROCEDURE

1-7 Adjustment of FK turret sensor position

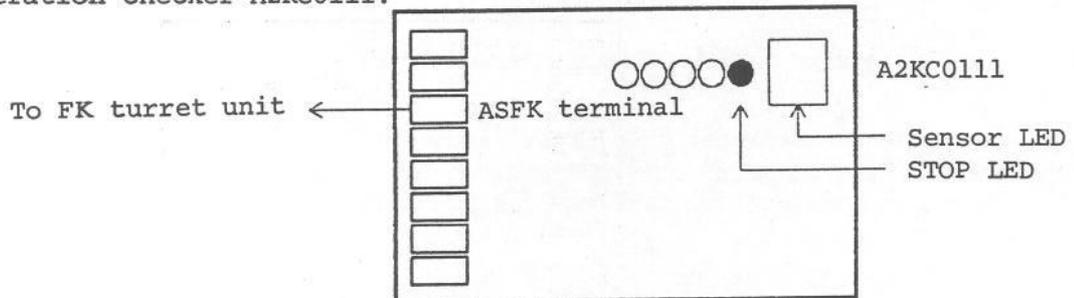
- (1) Remove the cover.
3PUK2.6x6SA screw × 4



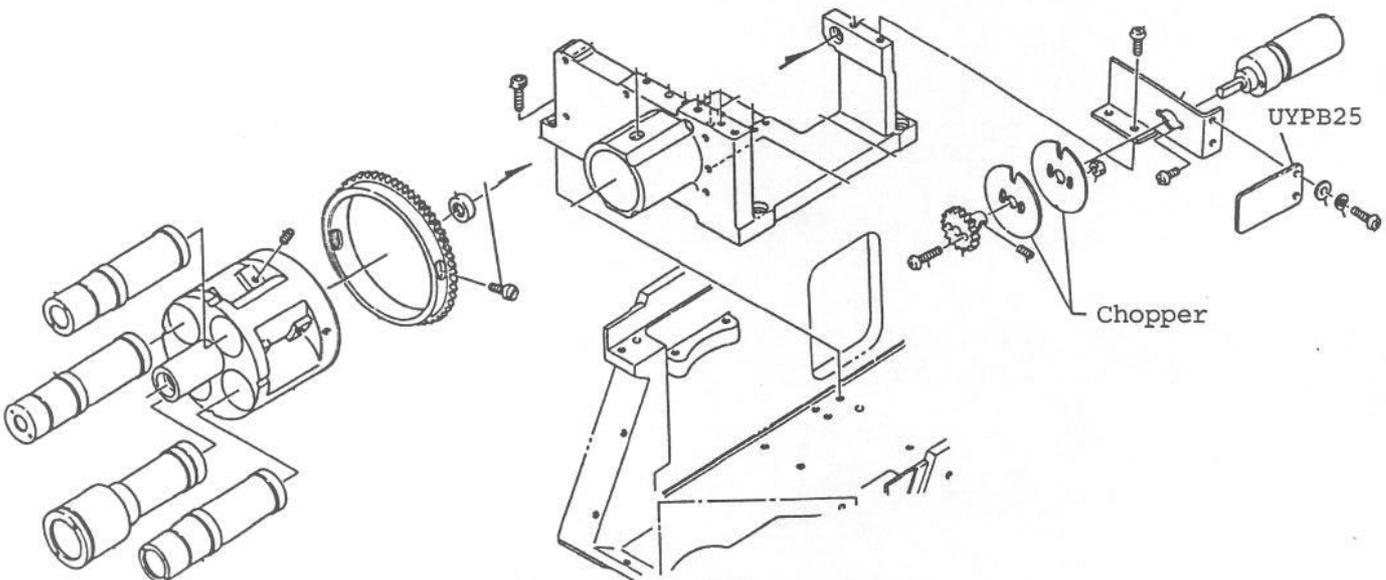
- (2) Remove the top cover.
CUK3x14SA screw × 2
CUK3x35SA screw × 4



- (3) Pull out J107 of AQ521900 and connect it to ASFK terminal of the operation checker A2KC0111.



- (4) Adjust the positions of UYPB25 and chopper so that the stop and sensor LEDs of the operation checker are lit at each click position.



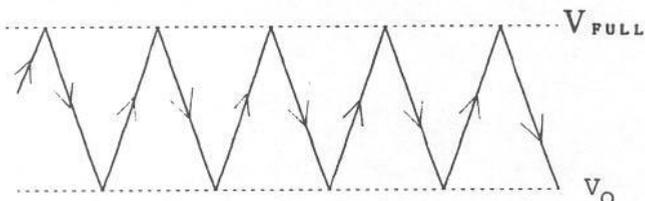
(6) Waveform observation

Press the "SET" button and verify that the waveform displayed on the oscilloscope screen is as shown below.

* The waveform should not lack.

$$V_{FULL} = 10.2375V$$

$$V_o = 0V$$



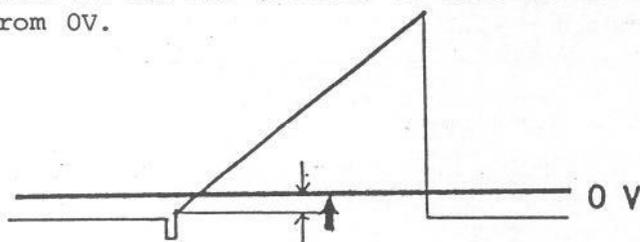
2-2. Startup Point Correction

(1) Set to the following state.

- Set the room as dark as possible.
- Change the optical path to photography (35L, etc.).
- Connect an oscilloscope to the PCB (UYPB53).

CH1-GND CH2-Output See the optical position to the SPOT.

(2) Adjust RV101 of the PCB (UYPB53) so that the integration waveform starts from 0V.



2-3. Photomultiplier Voltage (HV-L) Adjustment

(1) Attach the illuminometer (A2KC0012). (To the 35mm camera mounting position)

(2) Set the Koehler illumination.

- Focus on the specimen.
- Move CD up and down to focus on FS.
- Adjust the FS center.

* All adjustments should be made in this state thereafter.

(3) Set to the following state.

- ISO 6
- REC 0
- EXPADJ 0.5
- LBD Insert
- Objective 10X
- FS Full open
- Eliminate the specimen from the optical path.
- Pull the 100% camera selector knob (FL PHOTO).

(4) Open the shutter (EXPOSURE ON after MANUAL ON).

2. EXPOSURE ADJUSTMENT PROCEDURE

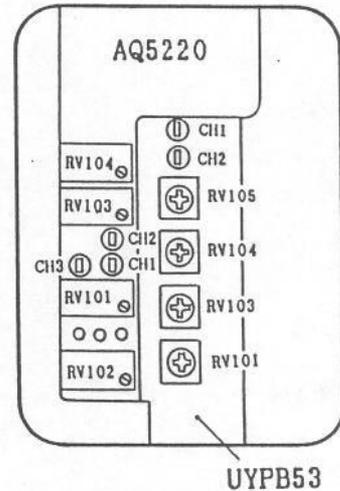
2-1. DA Converter Offset Adjustment

(1) Set to the following state.

- Set the room as dark as possible.
- Change the optical path to those (DF, BF, etc.) other than photography.
- Connect a digital voltmeter (or an oscilloscope) to the PCB (AQ5220).

CH1-GND CH2-Output

- * DA converter adjustment mode will be set by pressing the corresponding button (RESET/LOCK/RECALL/SET).



(2) Offset adjustment

Press the "RESET" button and adjust RV102 of the PCB (AQ5220) so that the output voltage V_o is 0V.

Standard	$-1.25\text{mV} < V_o < 1.25\text{mV}$
----------	--

(3) Lowest bit (1LSB) adjustment

Press the "LOCK" button and adjust RV101 of the PCB (AQ5220) so that the output voltage V_o is 2.5mV

Standard	$1.25\text{mV} < V_o < 3.75\text{mV}$
----------	---------------------------------------

(4) Highest bit (V_{FULL}) adjustment

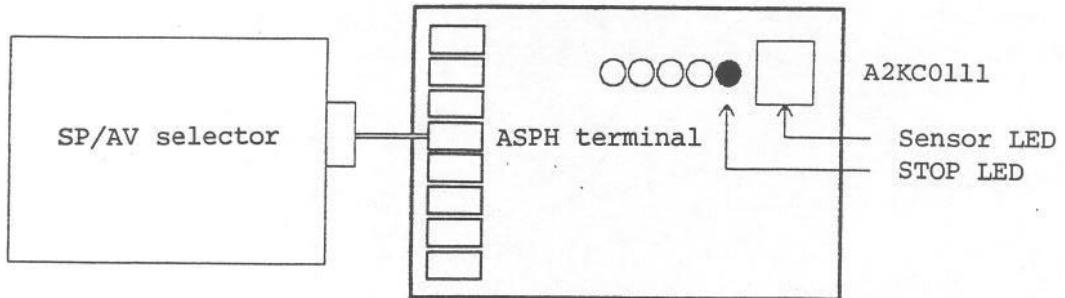
Press the "RECALL" button and adjust RV101 of the PCB (AQ5220) so that the output voltage V_{FULL} is 10.2375V.

Standard	$10.23625\text{V} < V_{\text{FULL}} < 10.23875\text{V}$
----------	---

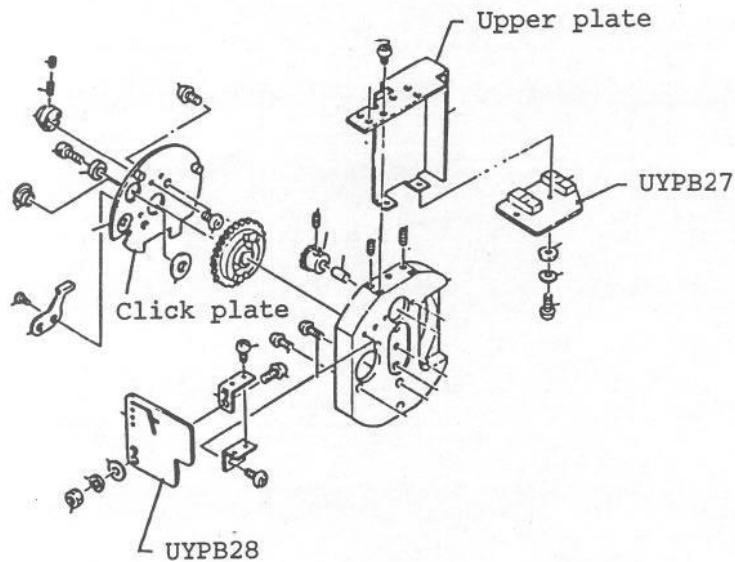
(5) Verify that the standards of (2) ~ (4) are satisfied. Otherwise, repeat (2) ~ (4).

B. REPAIR PROCEDURE

- (8) Connect the SP/AV selector to ASPH terminal of the operation checker A2KC0111.



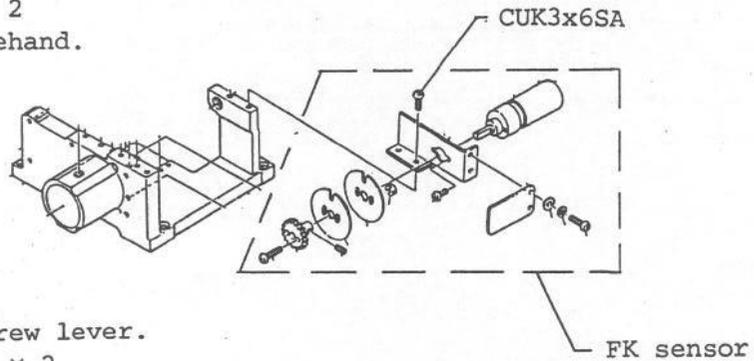
- (9) Verify that the stop LED of the operation checker is lit at each stop position and the sensor LED is "1" at SP and "0" at AV. Otherwise, adjust the positions of -UYPB27, UYPB28, upper plate and click plate.



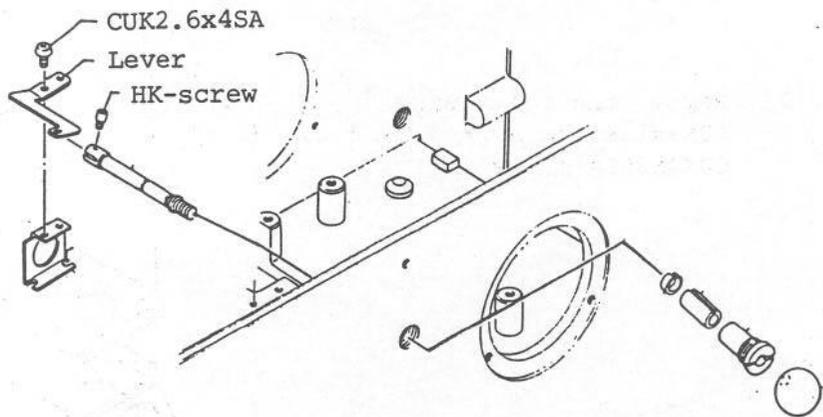
- (10) After the adjustment is finished, assemble the unit in the reverse order and mount it on the main body.
- (11) Verify that the exposure is the same as that before disassembling the unit. Otherwise, adjust it by changing the photomultiplier position.

B. REPAIR PROCEUDRE

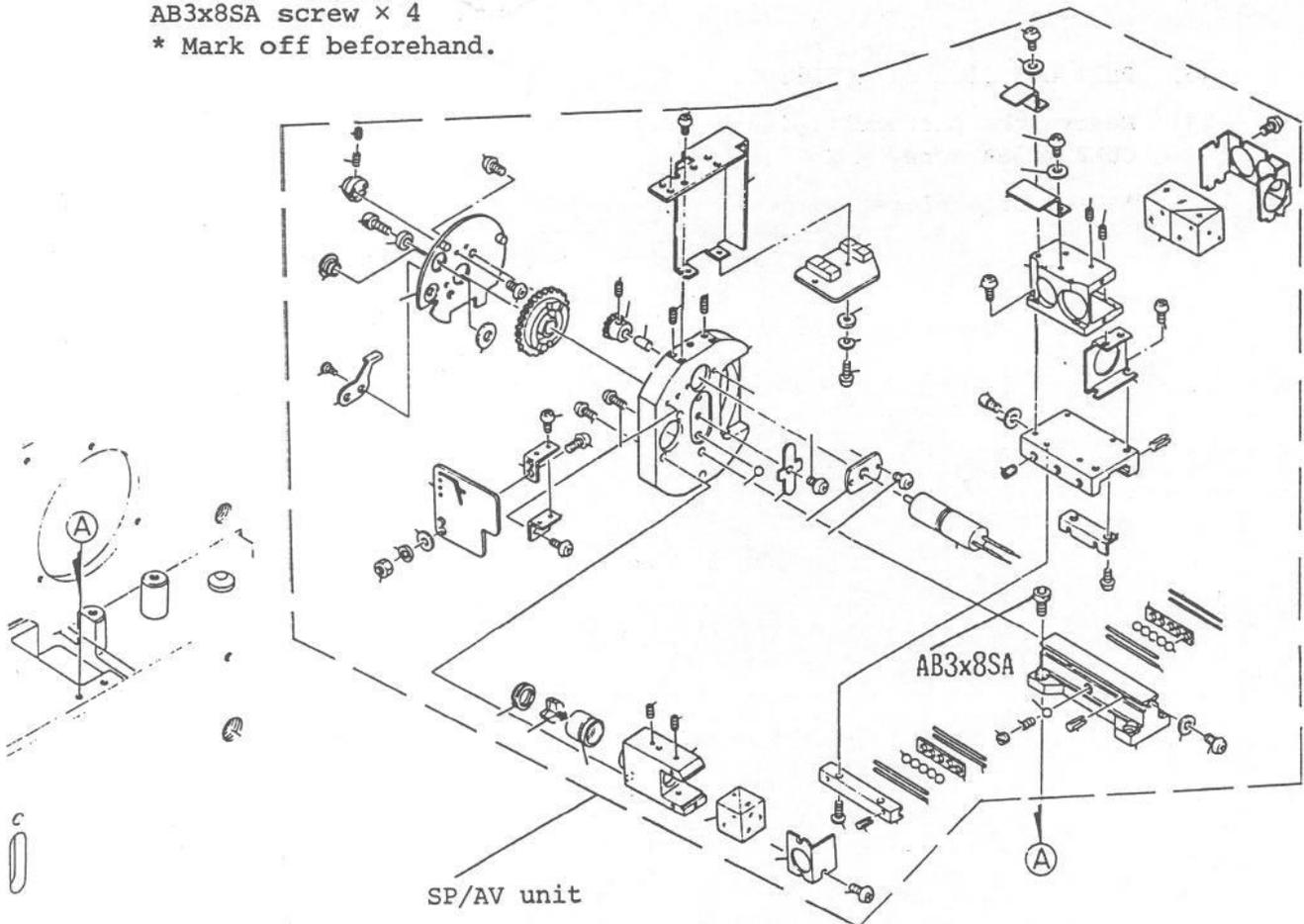
- (5) Remove the FK sensor.
 CUK3x6SA screw × 2
 * Mark off beforehand.



- (6) Remove the HK-screw lever.
 CUK2.6x4SA screw × 2



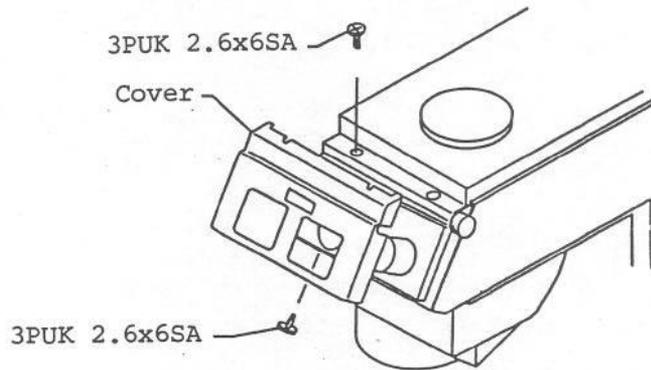
- (7) Remove the SP/AV selector.
 AB3x8SA screw × 4
 * Mark off beforehand.



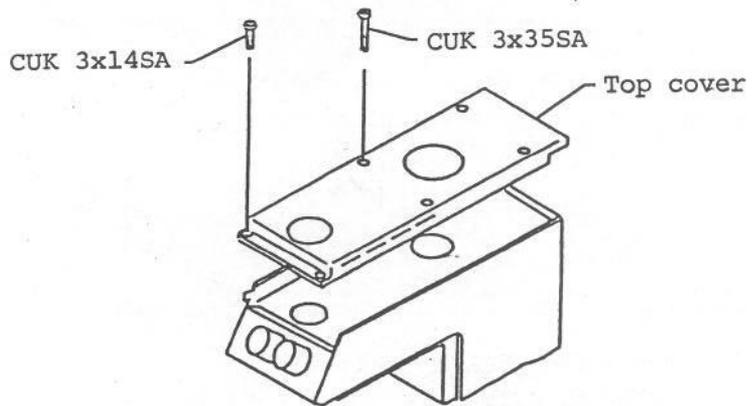
1-9 Adjustment of SP/AV selector sensor position

* Check the exposure time beforehand by referring to "2. Adjustment of Exposure" on page No. B-15.

- (1) Remove the cover.
3PUK2.6x6SA screw × 4

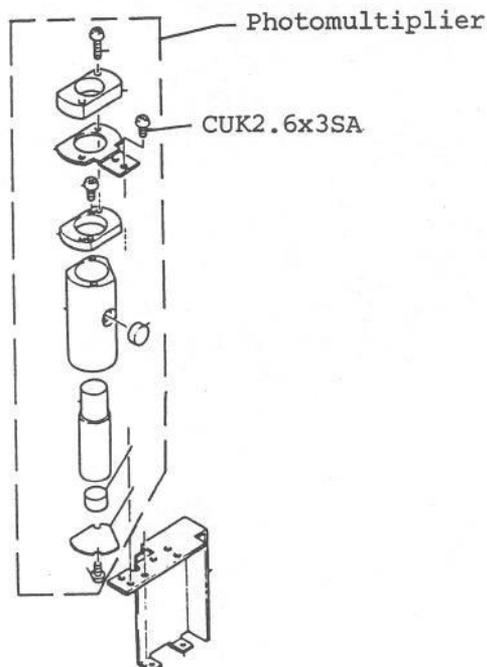


- (2) Remove the top cover.
CUK3x14SA screw × 2
CUK3x35SA screw × 4



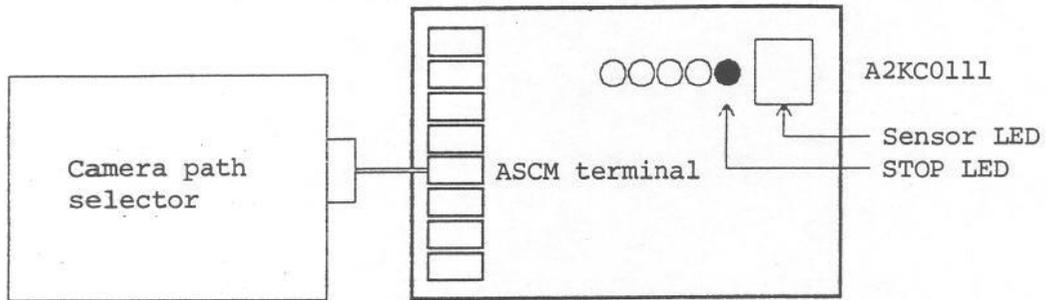
- (3) Pull out J108 of A0521900.
(4) Remove the photomultiplier.
CUK2.6x3SA screw × 2

* Mark off beforehand.



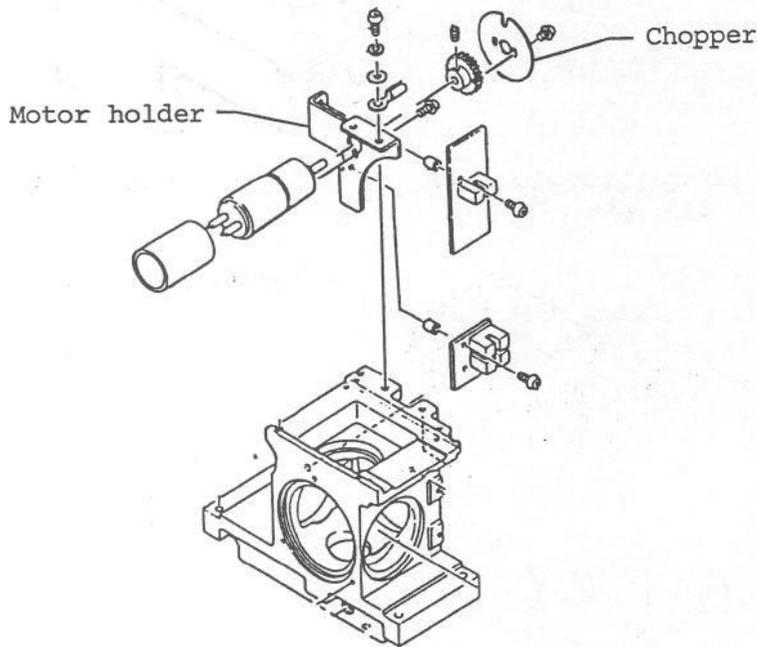
B. REPAIR PROCEDURE

- (4) Connect the camera path selector to ASCM terminal of the operation checker A2KC0111.



- (5) Press the forward/backward switch of the operation checker to rotate the camera path. The stop and sensor LEDs of the operation checker should be then lit for 0 ~ 3 at each click position. Otherwise, adjust the positions of the chopper and motor holder.

* Mount the camera path selector on the main body and adjust to the optic axes of the camera paths L and R confirmed before disassembling the unit.

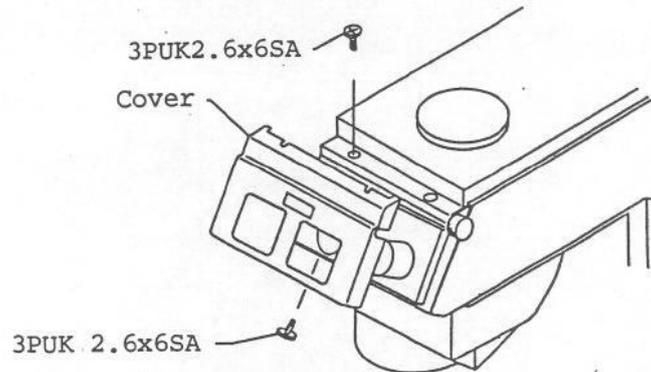


B. REPAIR PROCEDURE

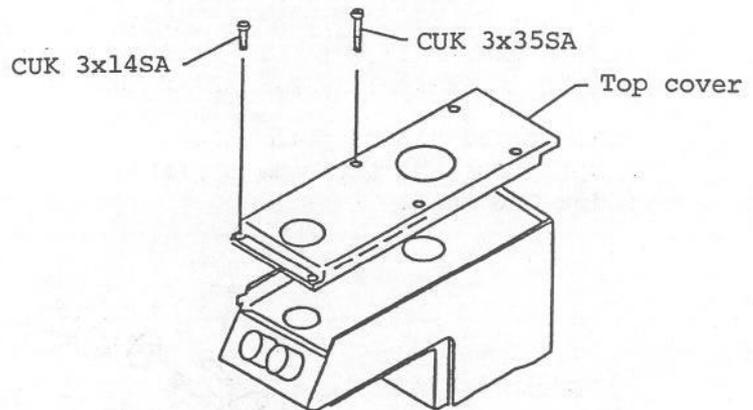
1-8 Adjustment of camera path selector sensor position

* Before disassembling the unit, confirm the optic axes of camera paths L and R by referring to "Checking the optic path (1) ~ (4) on page No. B-69.

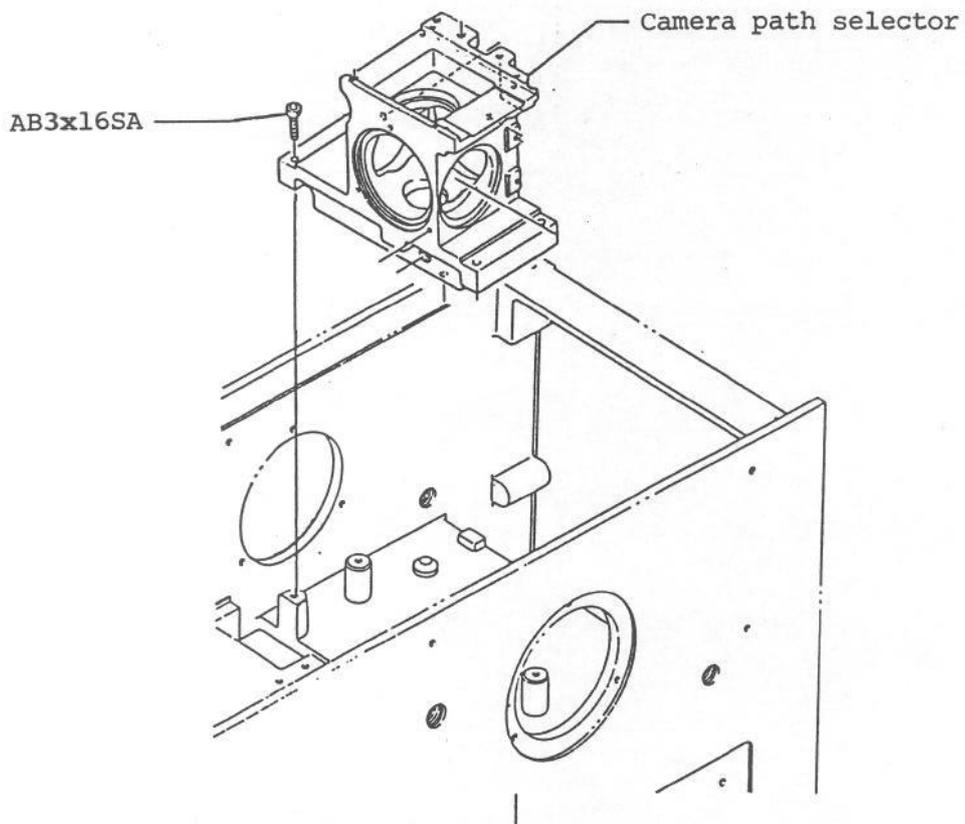
- (1) Remove the cover
3PUK2.6x6SA screw × 4



- (2) Remove the top cover.
CUK3x14SA screw × 2
CUK3x35SA screw × 4



- (3) Pull out J109 of AQ521900 and J101 of UYPB59, and remove the camera path selector. AB3x16SA × 4



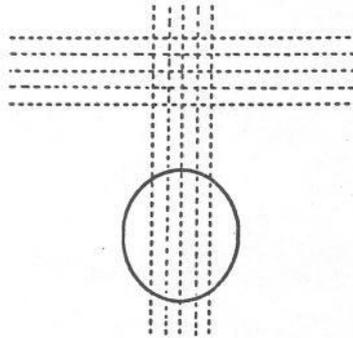
4-3. Sensor Signal Amplitude Check

- (1) Connect the AF adjustment PCB (A2KC0010) to the extension connector of the AHBS3 main body so that the AF signal can be observed with an oscilloscope.

* Refer to "4-1. Adjustment of Image Sensor Position" (1) ~ (4) on page No. B-27

- (2) Set the test plate OB-Micro 1/100 SQUARE (OB-M 1/100 SQ).

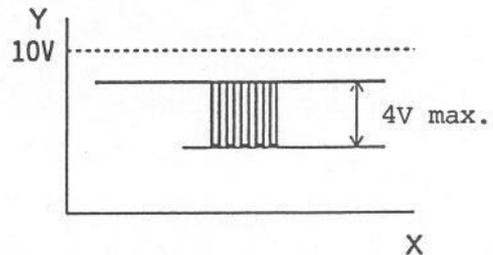
* Set the test plate at the position against the reticle circle as shown below.



- (3) Adjust the focus manually.
- (4) Turn on the selector switches 1 and 5 of the AF adjustment PCB (A2KC0010) and press the AF button of the control box.
- (5) Verify that the image surface amplitude at the focalized position meets the following standard.

Standard	4.0V max.
----------	-----------

* The signal should not be 0V/10V (saturated.)



- (6) If the standard is not met, re-check "4-2. Adjustment of Sensor Dynamic Range".

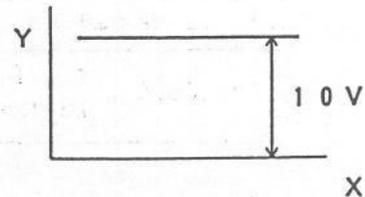
4-2. Adjustment of Sensor Dynamic Range

- (1) Connect the AF adjustment PCB (A2KC0010) to the extension connector of the AHBS3 main body so that the AF signal can be observed with an oscilloscope.

* Refer to "4-1. Adjustment of Image Sensor Position" (1) ~ (4) on page No. B-27.

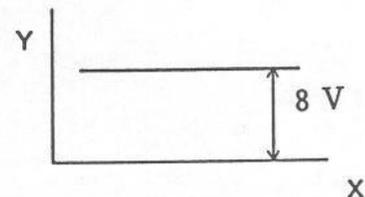
- (2) Turn on the selector switches 0 and 5 of the AF adjustment PCB (A2KC0010).
- (3) Pull the 100% camera selector knob (FL PHOTO), set the lamp voltage selector switch to "MAX" and press the AF switch.
- (4) Verify that the oscilloscope signal becomes linear at 10V.

- If the linear signal is not obtained at 10V, press the 100% camera selector knob (NORMAL) and turn on the selector switches 1 and 5 of the AF adjustment PCB (A2KC0010). Press the AF button and verify that the linear signal is obtained at 8V.



(Selector switches 0 and 5 ON)

- If the linear signal is not obtained at 8V, it is necessary to adjust the lamp voltage with the trimmer. (Refer to the AF Adjustment Manual.)



(Selector switches 1 and 5 ON)

- If the linear signal is obtained at 8V but not at 10V, adjust R135 in the AF PCB. In this case, re-confirm the correction signal of the AF Adjustment Manual.

- (5) Turn off the lamp voltage selector switch and verify that the signal level meets the following standard.

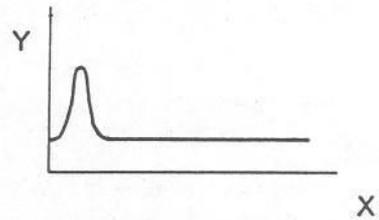
Standard	0 ~ 0.2V max.
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* If the standard is not met even after adjusting R135 of the AF PCB (AQ519900) in (4), R135 is turned excessively and must be re-adjusted.

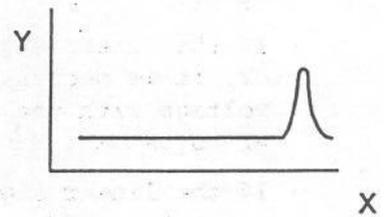
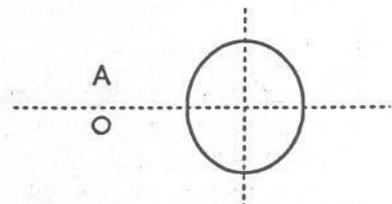
(9) Adjust the displacement in sensor inclination.

- Move the stage so that the pinhole signal comes to the leftmost of the oscilloscope. * Move the stage so that the peak comes to the left end of the signal. The pinhole position in the vertical direction at this time is assumed A.
- Move the stage so that the pinhole signal comes to the rightmost of the oscilloscope. * Move the stage so that the peak comes to the left end of the signal. The pinhole position in the vertical direction at this time is assumed B..

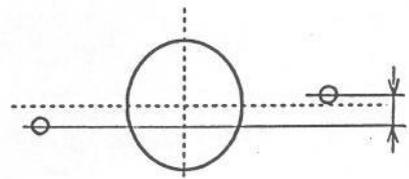
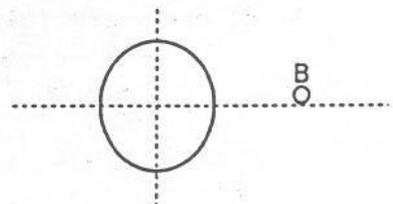
Standard	$A - B = \pm 0.1D \text{ max.}$ D: Reticle circle diameter
----------	---



* Move the stage so that the peak comes to the left end of the signal.



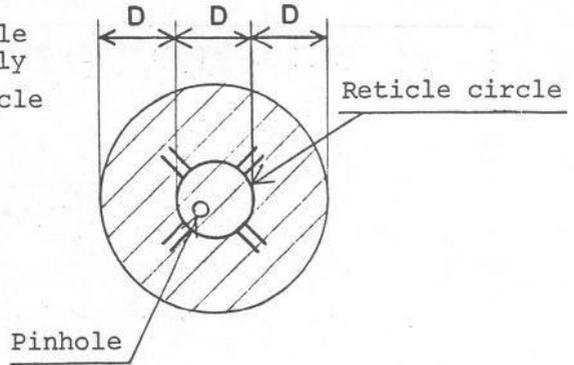
* Move the stage so that the peak comes to the left end of the signal.



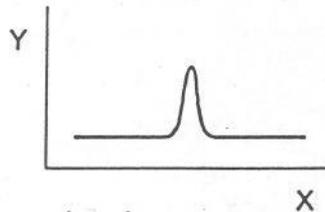
$A - B = \pm 0.1D \text{ max.}$

- (5) Set the biological low magnification pinhole specimen (KN0001), adjust the focus manually so that the pin hole is at the reticle circle center.

- * Set FK to 5X.
- * Select a position with no other pinhole in the range coaxial with the reticle circle and 3 times in diameter (shown shaded in the drawing on the right).

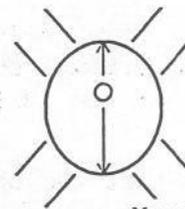


- (6) Turn on the switches 1 and 5 of the AF adjustment PCB (A2KC0010), and press the AF button of the control box.



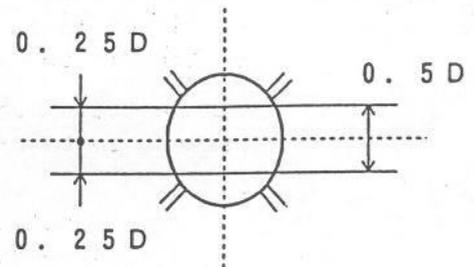
- (7) Adjust the sensor displacement in the vertical direction.

- When nothing appears with the signal at zero level, move the pinhole up and down to find a position where the signal can be observed.
- When the signal appears with the pinhole located above the center, move the AF PCB rightward.
- When the signal appears with the pinhole located below the center, move the AF PCB leftward.
- Search the position where the signal appears, and repeat (7) from the reticle center until the following standard is satisfied.



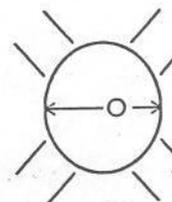
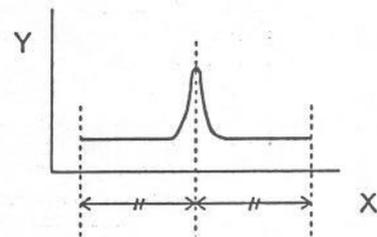
Move up and down the the pinhole within the visual field.

Standard	Up/down $\pm 0.25D$ D: Reticle diameter
----------	--



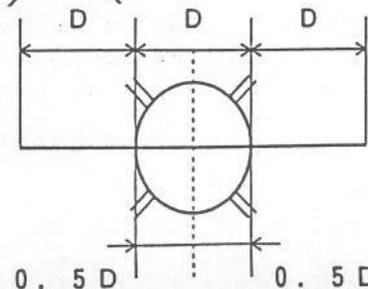
- (8) Adjust the sensor displacement in the horizontal direction.

- Move the pinhole up and down in the state where the pinhole signal can be observed on the oscilloscope screen, so that the signal peak comes at the center of X-axis.
- When the pinhole is on the right side of the visual field center, move the AF PCB downward.
- When the pinhole is on the left side of the visual field center, move the AF PCB upward.
- Search the position where the signal appears, and repeat (8) from the reticle center until the following standard is satisfied.



* Move the pinhole left and right within the visual field.

Standard	Left/right $\pm 0.5D$ D: Reticle diameter
----------	--



4. AF-PCB ADJUSTMENT

4-1. Adjustment of Image Sensor Position

- (1) Connect the AF adjustment PCB (A2KC0010) to the extension connector of the AHBS3 main body so that the AF signal can be observed with an oscilloscope.
 - ROM for AH3 (A3KC0003) should be mounted on the AF adjustment PCB (A2KC0010).
 - Connect the oscilloscope probes as follows:

X → W1	GND of X → W2
Y → W3	GND of Y → W4
 - Set the oscilloscope measuring range as follows:

X → 1V/div	Y → 2V/div
------------	------------
 - * Turn off the main switch of the AHBS3 main body before mounting and dismounting the AF adjustment PCB (A2KC0010).
- (2) Set the power selector switch of the AF adjustment PCB (A2KC0010) to "INT" position, then turn on the main switch and the lamp PHOTO switch of the AHBS3 main body.
- (3) Verify that the optical system is in the following state.
 - The 100% camera selector knob is pressed (NORMAL).
 - The light balancing filter (LED) is pressed (the knob is pressed).
 - No filter is in the filter box (FIL). The optical path is not blurred in the filter mount.
 - The FK scale (focusing glass/half-side frame exposure slider) are not in the FK scale insertion part.

Functions of Selector Switches of
AF adjustment PCB (A2KC0010)

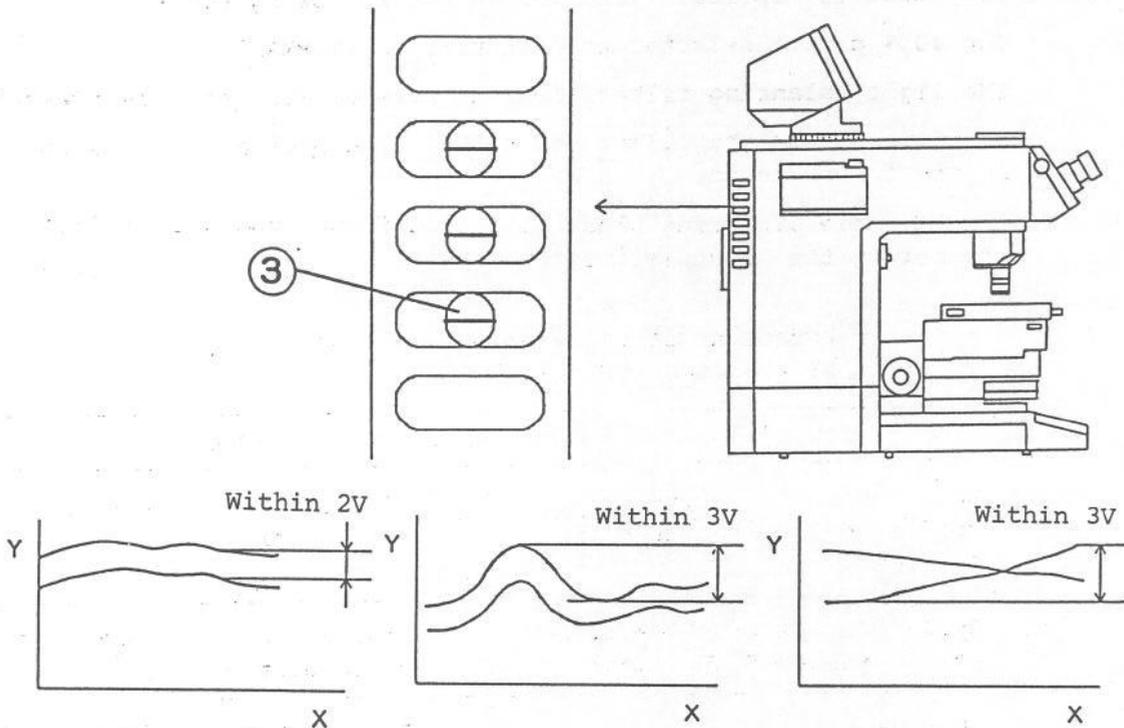
No.	Function	No.	Function
0	Not to apply a correction coefficient at the input of AF signal	4	Display the waveform at the middle part.
1	Apply a correction coefficient at the input of AF signal	5	Display the waveform of the whole part.
2	(Not used)	6	Display the waveform of the former half.
3	(Not used)	7	Display the waveform of the later half.

- (4) Set the SPlanApol0x and set the objective data.
 - * Determine the visual field iris (FS) center.
 - * Turn all the selector switches off.

3-3-3 Adjusting the pupil dividing ratio

- (1) Attach the SPlanApo10x to the revolving nosepiece and set the objective data. (without specimen)
 - * Determine the visual field iris (FS) center.
 - * Turn all the selector switches off.
- (2) Turn on the switches 0 and 5 of the AF adjustment PCB (A2KC0010), and press the AF button of the control box.
 - * Two non-corrected AF signal waveforms are displayed on the oscilloscope screen. They correspond to the AF signals when the pupil is divided into the left and right halves with the AF chopper.
 - * Press the AF button again to terminate the AF operation.
- (3) Adjust the rattling of the two screws ② (AB3x6SA) fixing the chopper motor ① so that the following standard is satisfied.
 - * Adjust the AF lamp voltage adjustment trimmer ③ so that the AF signal becomes 7 ~ 8V.

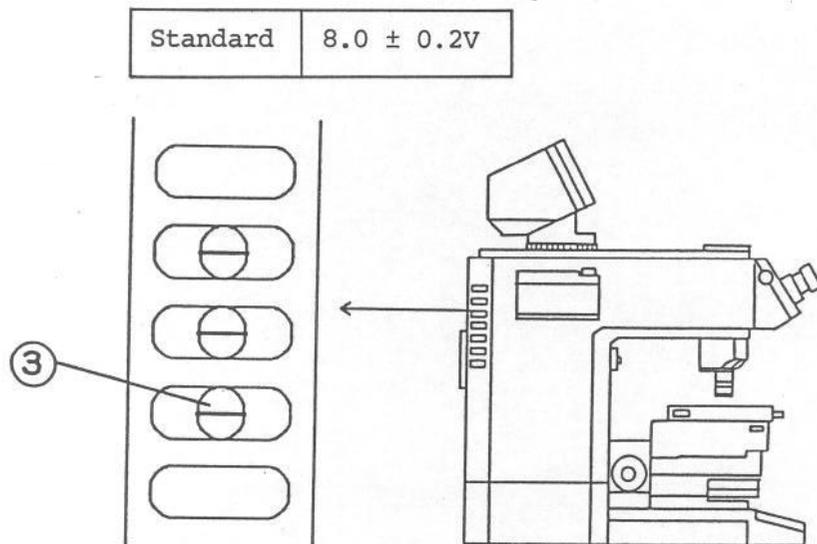
Standard	① The height difference of one waveform is within 3V. ② The difference between the two waveforms is within 2V.
----------	---



- (4) Change the objective to the 40X (SPlanApo or SPlan) and make the same adjustment as (1) ~ (3).
- (5) Verify that the above standard (see previous page) is satisfied with the objective of 1X ~ 40X.
* Otherwise, repeat (1) ~ (4).

3-3-4 Checking the correction signal

- (1) Turn on the switches 1 and 5 of the AF adjustment PCB (A2KC0010), and press the AF button of the control box.
* Be sure to use the objective SPlanApo10X.
* The corrected AF signal waveform is displayed on the oscilloscope screen.
- (2) Adjust the AF lamp voltage adjustment trimmer 3 so that the following standard is satisfied.



- (3) Verify that the standard is satisfied with the objective of 1X ~ 40X.

3-3-5 Checking the lamp voltage

- (1) Change the objective to SPlanApo10X and re-set the objective data. (without specimen)
- (2) Turn on the switches 1 and 5 of the AF adjustment PCB (A2KC0010), and press the AF button of the control box.
- (3) Verify that the AF signal is 8V in the no specimen state. Otherwise, perform "3-3-3 AF pupil division adjustment".

3-3-6 AF Operation check

- (1) Check the AF operation by using the AF limit specimen (KN0049)

3-3-2 Preparation for Adjustment

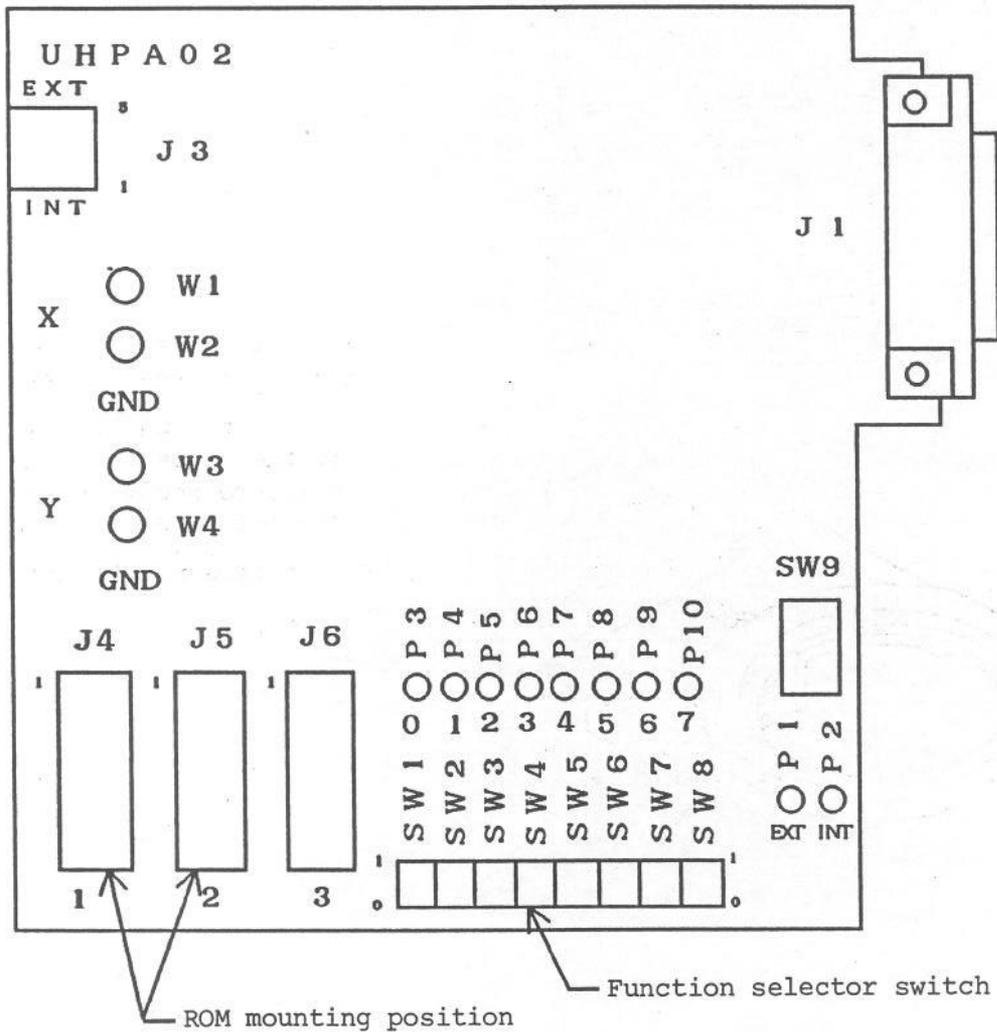
- (1) Connect the AF adjustment PCB (A2KC0010) to the extension connector of the AHBS3 main body so that the AF signal can be observed with an oscilloscope.
 - ROM for AH3 (A3KC0001) should be mounted on the AF adjustment PCB (A2KC0010).
 - Connect the oscilloscope probes as follows:
 - X → W1 GND of X → W2
 - Y → W3 GND of Y → W4
 - Set the oscilloscope measuring range as follows:
 - X → 1V/div Y → 2V/div
 - * Turn off the main switch of the AHBS3 main body before mounting and dismounting the AF adjustment PCB (A2KC0010).
- (2) Set the power selector switch of the AF adjustment PCB (A2KC0010) to the "INT" position, then turn on the main switch and the lamp PHOTO switch of the AHBS3 main body.
- (3) Verify that the optical system is in the following state.
 - The 100% camera selector knob is pressed (NORMAL).
 - The light balancing filter (LBD) is pressed (the knob is pressed).
 - No filter is in the filter box (FIL). The optical path is not blurred in the filter mount.
 - The FK scale (focusing glass/half-side frame exposure slider) are not in the FK scale insertion part.

Functions of Selector Switches of
AF adjustment PCB (A2KC0010)

No.	Function	No.	Function
0	Not to apply a correction coefficient at the input of AF signal	4	Display the waveform at the middle part.
1	Apply a correction coefficient at the input of AF signal	5	Display the waveform of the whole part.
2	(Not used)	6	Display the waveform of the former half.
3	(Not used)	7	Display the waveform of the later half.

3-3. AF Pupil Division Adjustment

3-3-1 External view of AF adjustment PCB (A2KC0010)

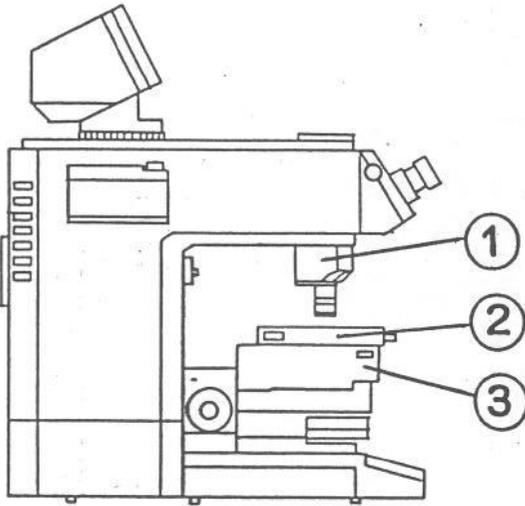


* Jig No.: AF adjustment PCB A2KC0010
 ROM for AH3 AF adjustment .. A3KC0001

B. REPAIR PROCEDURE

3-2. AF Standard Position Adjustment

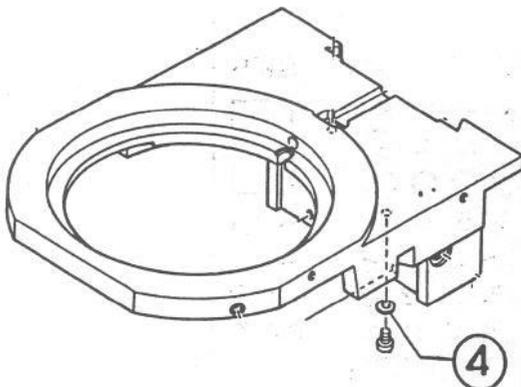
- (1) Remove the motorized revolving nose-piece ①, stage ② and condenser holder ③ from the main body.



- (2) Adjust the standard position with the washer ④ of the condenser holder ③.

* Adjust the washer by the deviation of the scale reading from the standard position (3-1. AF OPERATION CHECK).

* Take care not to lose the washer.



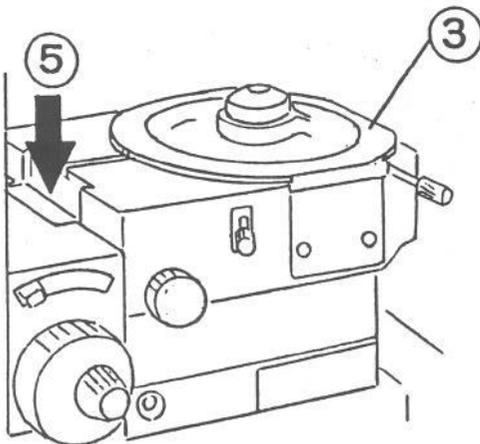
- (3) Replace the motorized revolving nose-piece ①, stage ② and condenser holder ③ to the main body.

* When replacing the condenser holder, make sure that it is inserted up to the index line ⑤ of the rear dovetail.

- (4) Check the operation according to "3-1. AF OPERATION CHECK".

* Adjustment is completed if the scale reading is within the standard range. Re-adjust if the scale reading is out of the standard range.

* When the stage is moved up to the upper limit, it should not interfere with each objective.



B. REPAIR PROCEDURE

3-1-3 Checking the AF standard position

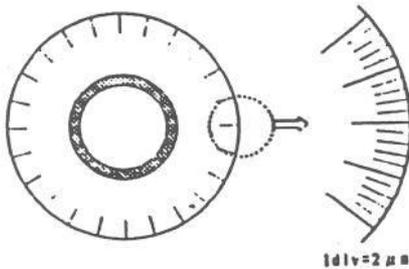
- (1) Set the stage at the standard position.

* By setting data with the 10X objective (SPlanApo or SPlan).

- (2) Read the fine adjustment knob scale.
(1 division: $2\mu\text{m}$)

- (3) Rotate the knob to the focal position and read the scale.
(1 division: $2\mu\text{m}$)

* The standard position is downward from the focal position. If it is upward, adjustment is required.



- (4) Normal if the scale reading is $300\mu\text{m}$ against the standard position.
($200 \sim 400\mu\text{m}$)

* Otherwise, adjustment is required.

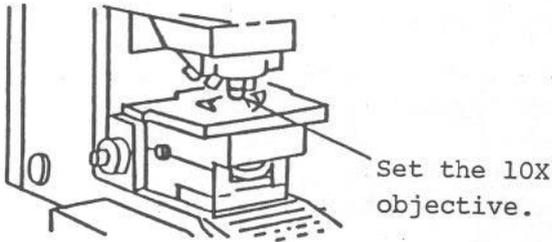
(For the adjustment method, refer to Page B-22 "3-2. AF STANDARD POSITION ADJUSTMENT".)

3. AUTO FOCUS ADJUSTMENT

3-1. AF Operation Check

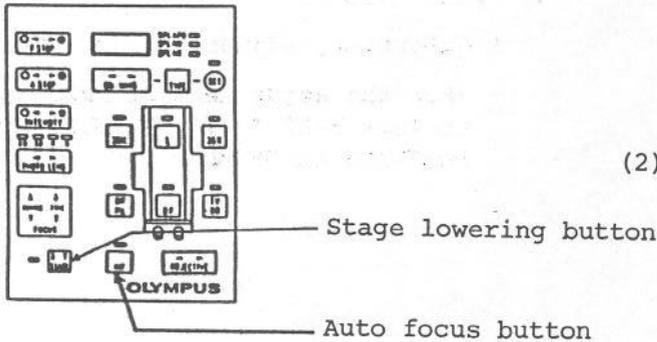
3-1-1 Preparation

- (1) Set the 10X objective (SPlanApo or SPlan).
- (2) Set the AF limit specimen (KN0049)
- (3) Adjust the visual field iris center and the condenser up/down.



3-1-2 Checking the AF operation

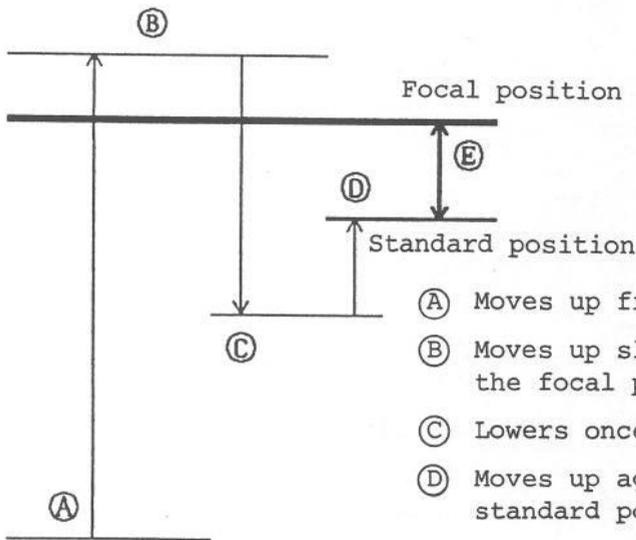
- (1) Push the stage lowering button to lower the stage.



- (2) Press the "AF" button.

- (3) Verify that the stage moves as illustrated on the left.

* Verify it by viewing through the viewer.



- (A) Moves up from LOWER LIMIT.
- (B) Moves up slightly from the focal position.
- (C) Lowers once.
- (D) Moves up again to the standard position
- (E) Distance from the focal position to the standard position

2-7. Linearity (150pF) Adjustment

(1) Set to the following state.

- ISO 100
- REC 0
- EXPADJ 1
- LBD Insert
- Objective .. 10X
- AS Full open
- Eliminate the specimen from the optical path.
- Pull the 100% camera selector knob (FL PHOTO).

(2) Adjust the light intensity and set it so that the exposure time is 56.98 sec or more.

Example) 3.20 min

(3) Change ISO to 400.

(4) Adjust RV105 of the PCB (UYPB53) so that the exposure time is 1/4 of the value set in (2).

Example) $3.20 \text{ (min)} \times 1/4 = 50 \text{ (sec)}$

2-5. Photomultiplier Voltage (HV-M) Adjustment

(1) Set to the following state.

- ISO 6
- REC 0
- EXPADJ 0.5
- LBD Insert
- Objective .. 10X
- AS Full open
- Eliminate the specimen from the optical path.
- Pull the 100% camera selector knob (FL PHOTO).

(2) Open the shutter (EXPOSURE ON after MANUAL ON).

(3) Adjust the light intensity so that the illuminometer reads within the following range.

Range	0.2071 ~ 13.50 Lx	Example) 0.45 Lx
-------	-------------------	------------------

(4) Set with RV103 of the PCB (AQ0522) so that the exposure time can be obtained from the following equation.

T: Exposure time (S) A: ISO ×EXPADJ
 L: Light intensity (Lx)

$T = \frac{20}{A \times L}$

Example) Assuming 0.45 Lx

$$T = \frac{20}{6 \times 0.5 \times 0.45} = 14.81(S)$$

2-6. Photomultiplier Voltage (HV-H) Adjustment

(1) Set to the following state.

- ISO 6
- REC 0
- EXPADJ 0.5
- LBD Insert
- Objective .. 10X
- AS Full open
- Eliminate the specimen from the optical path.
- Pull the 100% camera selector knob (FL PHOTO).

(2) Open the shutter (EXPOSURE ON after MANUAL ON).

(3) Adjust the light intensity so that the illuminometer reads within the following range.

Range	0.00039 ~ 0.2071 Lx	Example) 0.11 Lx
-------	---------------------	------------------

(4) Set with RV104 of the PCB (AQ0522) so that the exposure time can be obtained from the following equation.

T: Exposure time (S) A: ISO ×EXPADJ Example) Assuming 0.11 Lx
 L: Light intensity (Lx)

$T = \frac{20}{A \times L}$

$$T = \frac{20}{6 \times 0.5 \times 0.11} = 1.01(MIN)$$

- (5) Adjust the light intensity so that the illuminometer reads within the following range.

Range	13.5 ~ 666 Lx	Example) 26.7 Lx
-------	---------------	------------------

- * Adjust the light intensity with "INTENSITY" and "A.STOP" (AS). Use ND-FILTER in FILTER-BOX if it is not completely adjusted.
- * Do not adjust it by moving the condenser up and down or with "F.STOP" (FS). (Same thereafter)

- (6) Set with RV101 of the PCB (AQ5208) so that the exposure time can be obtained from the following equation.

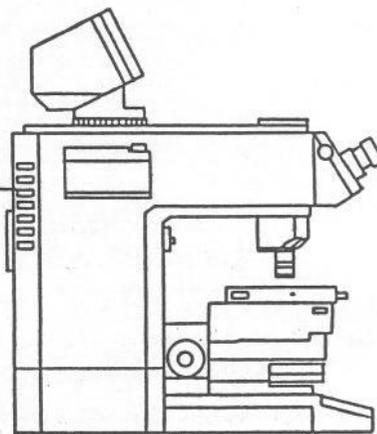
T: Exposure time (S) A: ISO × EXPADJ
L: Light intensity (Lx)

$$T = \frac{20}{A \times L}$$

Example) Assuming 26.7 Lx

$$T = \frac{20}{6 \times 0.5 \times 26.7} = 0.25 \text{ (S)}$$

Power supply
unit



2-4. 50/100% Camera Selector Ratio Adjustment

- (1) Set to the following state.

- ISO 6
- REC 0
- EXPADJ ... 0.5
- LBD Insert
- Objective. 10X
- FS Full open
- Eliminate the specimen from the optical path.
- Press the 100% camera selector knob (NORMAL).

- (2) Open the shutter (EXPOSURE ON after MANUAL ON).

- (3) Adjust the light intensity so that the illuminometer reads within the following range.

Range	13.5 ~ 666 Lx	Example) 26.7 Lx
-------	---------------	------------------

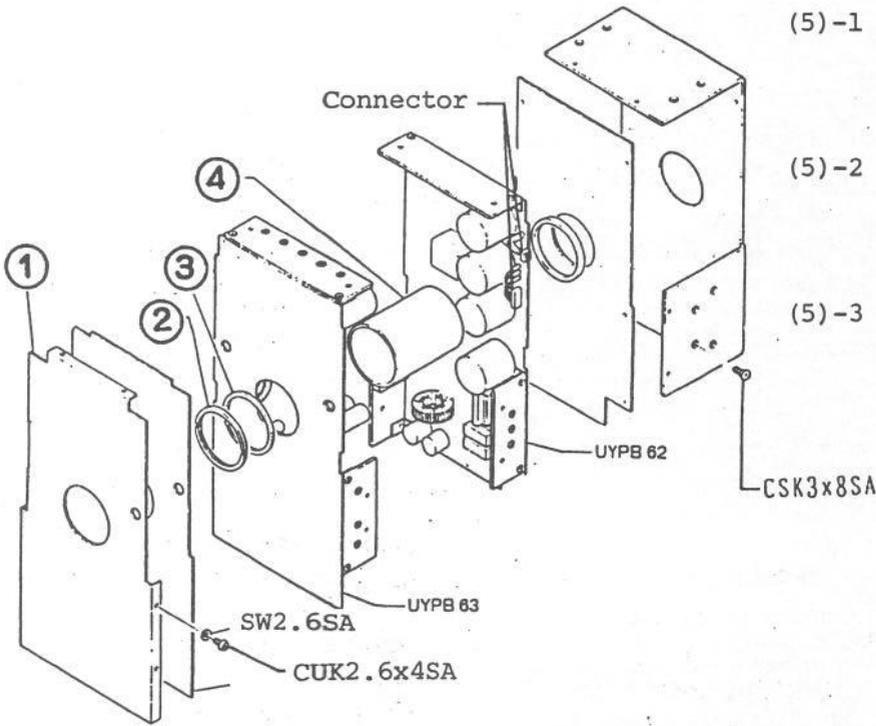
- (4) Set with RV104 of the PCB (UYPB53) so that the exposure time can be obtained from the following equation.

T: Exposure time (S) A: ISO × EXPADJ
L: Light intensity (Lx)

$$T = \frac{20}{A \times L}$$

Example) Assuming 26.7 Lx

$$T = \frac{20}{6 \times 0.5 \times 26.7} = 0.25 \text{ (S)}$$



(5) Disassemble UYPS01 (UYPS03).

(5)-1 Remove the cover ①.

CUK2.6x4SA screw × 6
SW2.6SA washer × 6

(5)-2 Remove the ring ②.

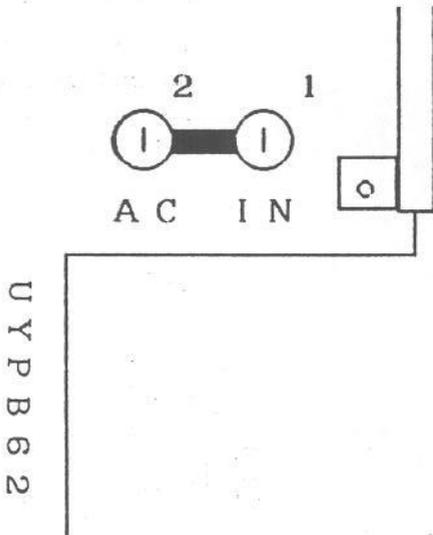
* The spacer ③ comes off together.

(5)-3 Remove UYPB63.
CSK3x8SA screw × 6

* Disconnect the two connectors of UYPB62 beforehand.

* The spacer ④ comes off together.

5-3 Adjustment procedure



(1) Connect the two connectors which were disconnected in "B-33, (5)-3". Apply the input voltage of the primary side (AC85 ~ 137V or AC180 ~ 270V) to "AC IN" of UYPB62.

* Apply the input voltage of the primary side directly to "AC IN" by using an alligator clip, etc.

* LED1 to LED5 of UYPB63 will be lit.

* D25 of UYPB62 will be lit.

5. POWER SUPPLY UNIT ADJUSTMENT

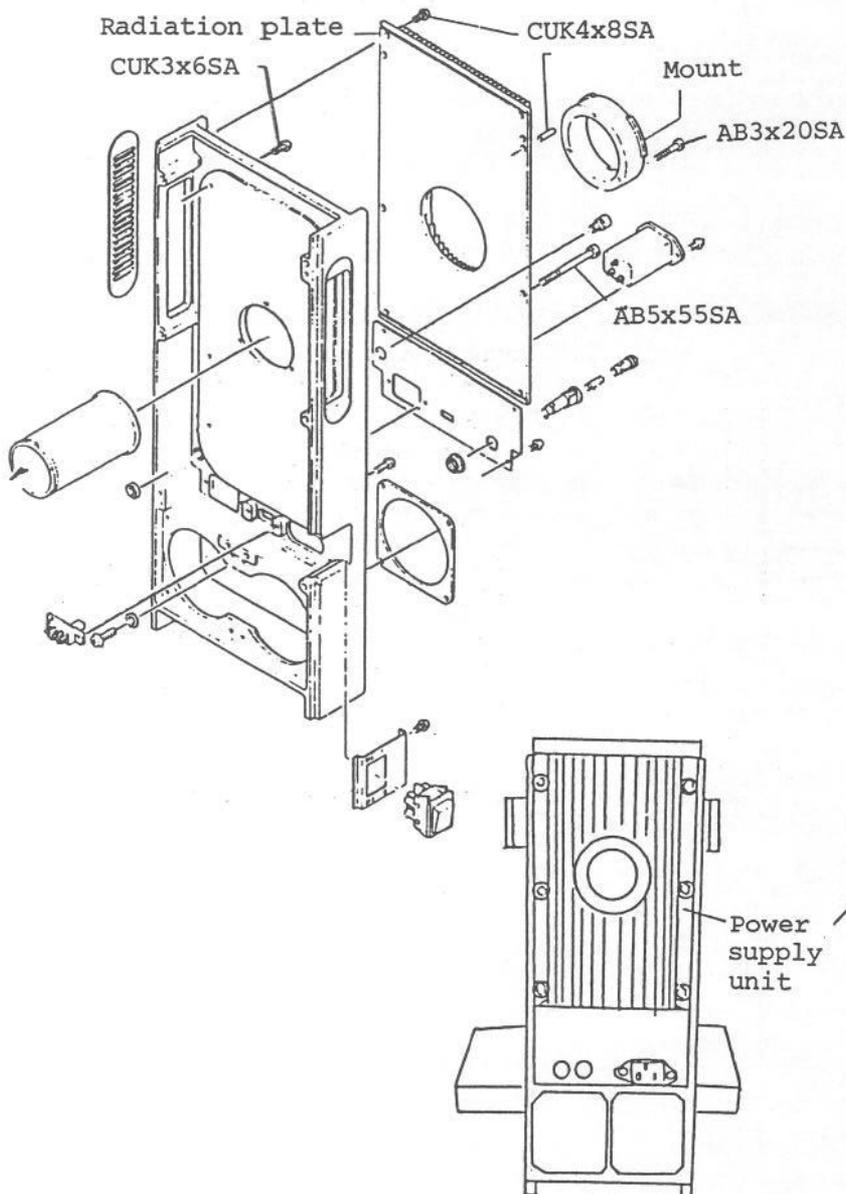
5-1 Introduction

The power supply unit UYPS01 of AH3 (UYPS03 in the 200V version) is the unit to supply all the power required by AH3. It consists of UYPB62, UYPB63 and mechanical parts including a cover. The UYPS01 permits switching of 100V and 200V simply by replacing the short plug.

* 1 : Insert the short plug of UYPB62 into J1 for the 100V version (AC85 ~ 137V). Insert the short plug into J2 for the 200V version (AC180 ~ 270V).

* AF adjustment is required after the power supply unit adjustment in AHBS3.

5-2 Disassembling procedure



- (1) Remove the mount.
AB3x20SA screw × 3
- (2) Remove the power supply unit
AB5x55SA screw × 6
- (3) Remove the radiation plate.
CUK4x8SA screw × 4
- (4) Remove UYPS01 (UYPS03).
CUK3x6SA screw × 6

* Disconnect all the connectors making connection with the main body.