ADJUSTING MANUAL FOR

UNIMET MICROSCOPE

FEB - 2 1982

ADJUSTING MANUAL

FOR

UNIMET MICROSCOPE

UNITRON Instruments, Inc
A Subsidiary of Ehrenreich Photo-Optical Industries, Inc
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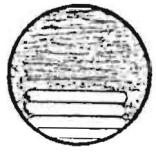
I. Centering Adjustment of Lamphouse

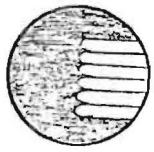
1-1 Place a stage insert plate on the stage and then a section stage micrometer (Tool No. T-2-25) or 72 mm-dia. mirror (Tool No. T-2-24) thereon and insert an eyepiece (NWF 10x) into the binocular head. Focus the image of the section stage micrometer through the eyepiece using the 10x objective and manipulating the coarse and fine focus control knobs.

1-2 Pull out the eyepiece from the binocular head and manipulate the lamphouse adjustment knobs (G-25, G-26) to bring the filament to the center of the binocular field of view while directly looking at the lamp filament in the binocular head.

Example:



When the lamp filament is located in the lower portion of the field of view, turn the lamphouse adjustment knob B (G-26) clockwise.



When the lamp filament is located at the right of the vield of view, turn the lamphouse adjustment knob A (G-25) clockwise

Thus the lamp filament can be brought to the center of the binocular field of view by turning the lamphouse adjustment knob B (G-26) if the lamp filament is deflected in the vertical direction, and by turning the lamphouse adjustment knob A (G-25) if the lamp filament is deflected in the horizontal direction.

II. Centering Adjustment of Aperture Diaphragm

2-1 Remove the illuminator section (Refer to Drawing No. UNIMET-H).

1) Turn the coarse focus control knob counterclockwise using your right hand to raise the arm (B-5) and the entire stage until it stops.

2) Loosen the fixing screw (A-28) and remove the illuminator section from the body frame (A-1).

2-2 Remove the revolving nosepiece

1) Remove the lowest power objective (as 5x) alone of the five objectives mounted on the revolving nosepiece of the removed illuminator.

2) Rotate the revolving nosepiece so that the opening of the revolving nosepiece from which the objective has been removed comes in position.
Turn counterclockwise the screwed ring (H-45) that fixes the revolving nosepiece using the revolving wrench (Tool No. T-1-13) through the opening to loosen it and remove the revolving nosepiece from the illuminator.

2-3 Remove the mirror mount (H-3).

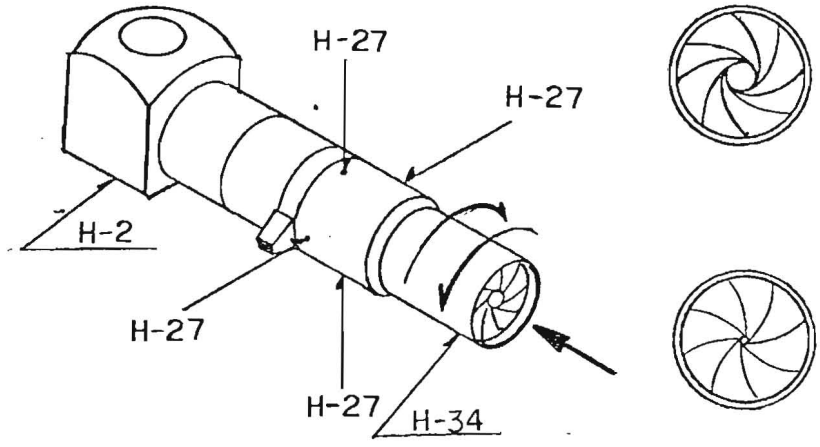
1) Remove the side cover (H-6) on the left side of the mirror box (H-2) of the illuminator section using the minus-face screwdriver (Tool No. T-1-2).

2) Loosen the screw (H-13) using the minus-face screwdriver (Tool No. T-1-2) to pull it out and remove the mirror mount (H-3) from the mirror box.

2-4 Adjustment of diaphragm size

1) Lower the "A" mark diaphragm lever (H-26) and control the aperture diaphragm size to a minimum to adjust its size to about 1 mm in diameter when viewed from behind the illuminator, in the following manner.

If the diaphragm diameter is too large, slightly loosen the four setscrews (H-27), turn the coupler (H-34) alone in the clockwise direction as viewed from the arrow direction while holding the mirror box (H-2) and "A" diaphragm lever, to adjust the diaphragm diameter to about 1 mm, and fix the coupler with four setscrews (H-27).
If the diaphragm diameter is too small, turn the coupler (H-34) counterclockwise to adjust the diaphragm diameter to about 1 mm.

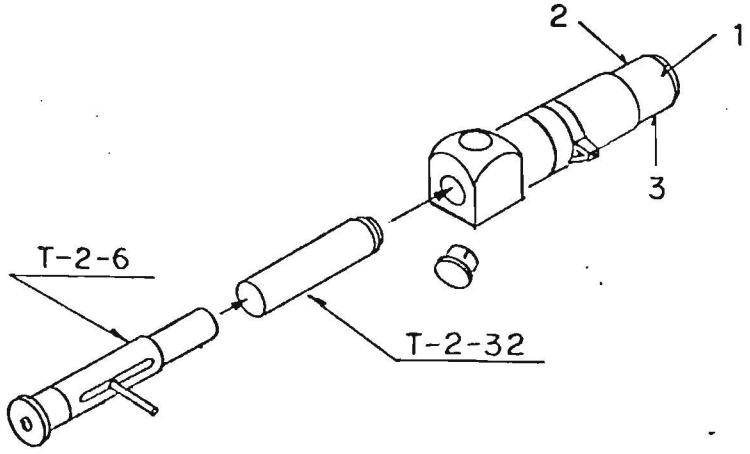


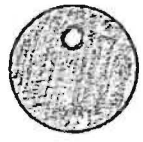
2-5 Centering of diaphragm

1) Remove the cap (H-7) on the front of the mirror box of the illuminator section using the minus-face set screwdriver (Tool No. T-1-2), screw in the centering adjustment monocular tube (Tool No.T-2-32) securely, and insert the centering telescope (Tool No. T-2-6) into the centering tube.

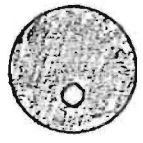
2) Lower the "A" mark diaphragm lever (H-26), control the aperture diaphragm size to a minimum, move the zoom adjustment lever of the centering telescope back and forth to focus the aperture diaphragm vane (H-39) while looking at the illuminator section

through the centering telescope, and make centering adjustment in the following manner so that the center of the diaphragm is aligned to the center of the centering telescope.

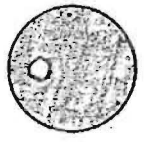




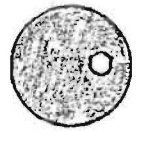
When the center of the diaphragm is positioned in the upper portion of the field of the centering telescope:
Slightly loosen the setscrew 3 in the figure and slightly fasten the setscrews 1 and 2 .



When the center of the diaphragm is positioned in the lower portion of the field of the centering telescope:
Slightly loosen the setscrews 1 and 2 in the figure and slightly fasten the setscrew 3 .



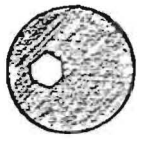
When the center of the diaphragm is positioned in the left of the field of the centering telescope:
Slightly loosen the setscrews 1 and 3 in the figure and fasten the setscrew 2 .



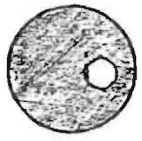
When the center of the diaphragm is positioned at the right of the field of the centering telescope:
Slightly loosen the setscrews 2 and 3 in the figure and fasten the setscrew 1 .

3) After the "A" diaphragm center has been adjusted by the preceding procedure, conduct iris diaphragm centering adjustment (Section III) of the microscope in which the darkfield illuminator is mounted.

4) After the size adjustment and centering adjustment of the "A" diaphragm (including the adjustment of the iris diaphragm in case of the darkfield illuminator), remove the centering adjustment monocular tube (Tool No. T-2-32) and the centering telescope (Tool No. T-2-6) and install the removed parts in their original positions.



When the center of the diaphragm is at the left of the field of the centering telescope: Slightly loosen the setscrew 3 and fasten the setscrew 2 .



When the center of the diaphragm is at the right of the field of the centering telescope: Slightly loosen the setscrew 2 and fasten the setscrew 3 .

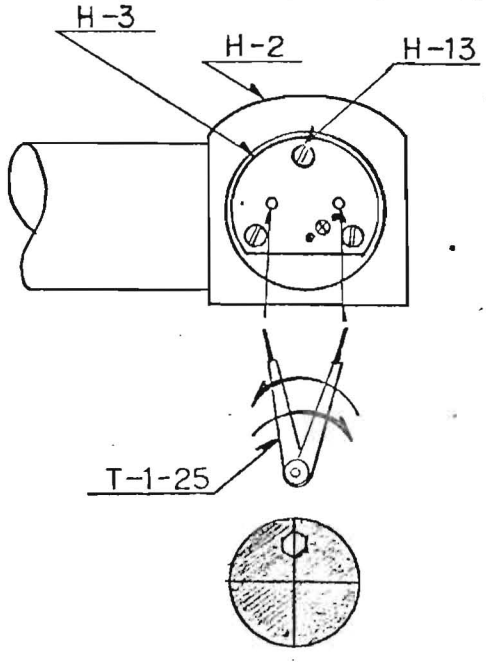
IV. Positional Adjustment of Plane Glass Reflector

4-1 After making the centering adjustment of the aperture diaphragm and iris diaphragm, insert the illuminator into the HL mount (A-3) of the body and securely clamp it with the fixing screw (A-28).

4-2 Place the section stage micrometer (Tool No. T-2-15) on the stage and bring the 10x objective in position. Focus the image of the section scale through the NWF 10x eyepiece by controlling the coarse and fine focus control knobs.

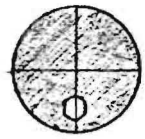
4-3 Pull out the eyepiece from the binocular head and insert the centering telescope (Tool No. T-2-6) in place of the eyepiece. Then lower the "A" mark diaphragm lever and regulate the aperture diaphragm. Focus the diaphragm by moving the zoom adjustment lever of the centering telescope back and forth.

4-4 If the center of the diaphragm is off the center of the centering telescope in 4-3, remove the side cover (H-6) on the left side of the mirror box (H-2) using a minus-face set screwdriver (Tool No. T-1-2), change the angle of the mirror mount (H-2) fixed inside the mirror box using the divider (Tool No. T-1-25), minus-face set screwdriver (Tool No. T-1-2) and plus-face set screwdriver (Tool No. T-1-1), and make centering adjustment in the following manner.

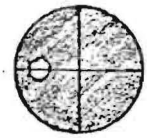


When the center of the diaphragm is positioned in the upper portion of the field of the centering telescope:
Slightly loosen the three screws (H-13) that fixes the mirror mount (H-3), apply the divider to the pinhole, and turn it counterclockwise little by little while looking through the centering telescope. After moving the mirror mount, securely fix the three setscrews.

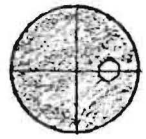
When the center of the diaphragm is positioned in the lower portion of the field of the centering telescope:



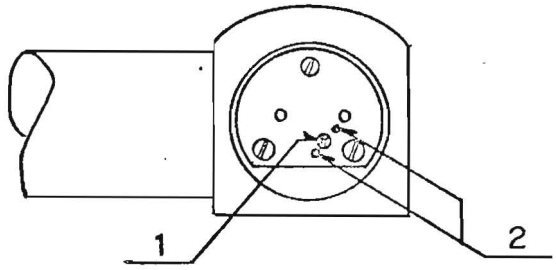
Apply the divider to the pin-hole in the same manner and turn it clockwise little by little while looking through the centering telescope.



When the center of the diaphragm is positioned at the left of the field of the centering telescope:
Slightly loosen the screw 1 (Na2608) and slightly fasten the screw 2 (Nh2004).



When the center of the diaphragm is positioned at the right of the field of the centering telescope:
Slightly loosen the screw 2 (Nh2004) and slightly fasten the screw 1 (Na2608).



Note: Centering adjustment of iris diaphragm for the darkfield column when provided with the iris diaphragm

1) After the positional adjustment of the plane glass reflector has been completed as per pars. 4-1 through 4-4, pull out the centering telescope from the binocular head, reinsert the NWF10x (or WFH10xR) eyepiece with concentric circle reticle (Tool No. T-2-28), move the "A" mark diaphragm lever upward, and fully open the aperture diaphragm.

2) Lower the iris diaphragm lever, control the iris diaphragm. If the image of the iris diaphragm is off the center of the concentric reticle eyepiece, correct it in the manner given in par. 3-2 in the Centering Adjustment of Iris Diaphragm.

V. Centering Adjustment of Reflecting Mirror

5-1 Positional Adjustment of Reflecting Mirror

5-1-1) Remove the revolving nosepiece from the microscope which you wish to make centering adjustment of reflecting mirror. Install this revolving nosepiece to a up-right type metallurgical microscope which have 170 mm mechanical tube length (UNION model STUDIMET is recommended to prepare for your standard). Install the objectives of the microscope (which you wish to make this adjustment) on the threads of the revolving nosepiece installed on the up-right type metallurgical microscope, in the order of 10x, 20x, 40x and 80x or 100x.

5-1-2) Put a section stage micrometer (Tool No. T-2-25) on the stage of the above said up-right type metallurgical microscope. Bring the center of section stage micrometer to the center of field of view (crossed position of cross reticle mounted in the eyepiece) by controlling the stage. The center of the section stage micrometer which was brought to the center of field of view will be a reference for the adjustment. And, the reference is called "origin" hereinafter.

5-1-3) Rotate the revolving nosepiece in the order of 20x, 40x, 100x and observe and record the position of the "origin" which may be out of center.

5-1-4) Remove the revolving nosepiece from the up-right type metallurgical microscope and install it on the UNIMET microscope without changing the position of each objective.

5-1-5) Insert the NWF10x (Tool No. T-2-14A) into the right binocular sleeve and make diopter adjustment of the eyepiece.

5-1-6) Place the section stage micrometer on the stage of UNIMET microscope and fix it with the stage clips.

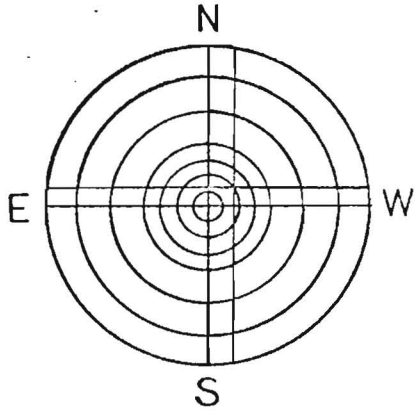
5-1-7) Rotate the coarse and fine focus control knobs, and focus the image of the section stage

micrometer looking through the eyepiece, with the 10x objective.

5-1-8) Operate the stage X-Y direction movement knobs looking through the eyepiece so as to bring the center of the image of the section stage micrometer to approximate center of the eyepiece.

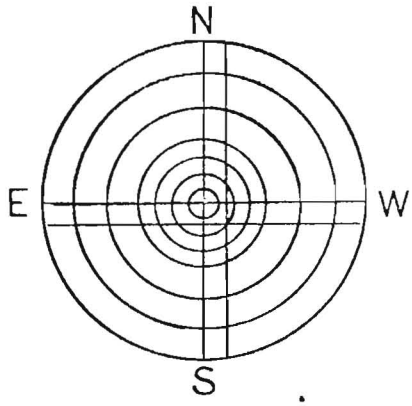
5-1-9) Change over the revolving nosepiece to the highest power objective 80x or 100x.

5-1-10) Here, reference is to be made to the data obtained according to above article 3). Suppose that the "origin" of the 80x or 100x objective was recorded as shown below when using the up-right type metallurgical microscope. In the centering adjustment of the reflecting mirror, it is based on only the "origin" position of the 80x or 100x objective.



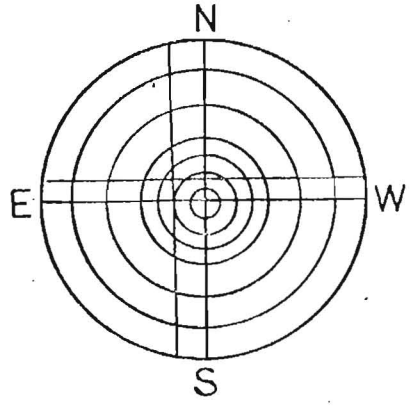
Position of the "origin" in connection with 100x objective recorded when using the up-right type metallurgical microscope.

5-1-11) Operate the stage X-Y direction movement knobs of UNIMET microscope, looking through the eyepiece, and adjust the center of the section stage micrometer to symmetric position against "E-W" line of cross reticle as shown below.



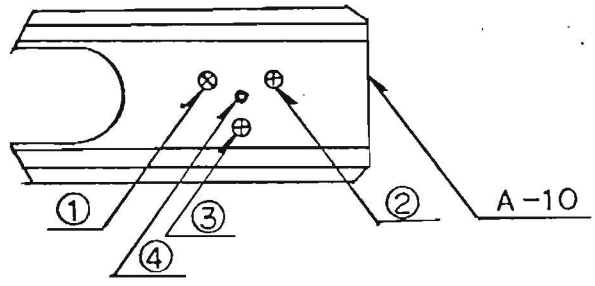
Position of the "origin" brought to a symmetric position against "E-W" line by controlling the X-Y stage movement knobs.

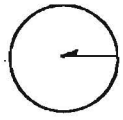
5-1-12) Change over the revolving nosepiece to the 10x objective only again for microscope observation. Suppose that the center of the section stage micrometer is at a position as shown below. Move the deflection of the section stage micrometer to the center of field of view by inclining the reflecting mirror.



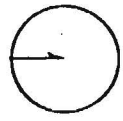
Position of the section stage micrometer center when the revolving nosepiece is changed over from 100x to 10x.

5-1-13) For making the inclining adjustment of the reflecting mirror (H-2), loosen the bolts (E-2) of the photo box board (E-1) using a minus-face screwdriver and adjust the adjustment screw on the undersurface of the slide guide (A-10) provided to the body frame (A-1) in the following manner using the plus-face set screwdriver (Tool No. T-1-1) and minus-face set screwdriver (Tool No. T-1-2).

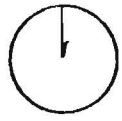




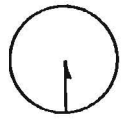
Slightly loosen the setscrew ① and fasten setscrews ② and ③.



Slightly loosen the setscrew ② and fasten setscrews ① and ③.



Loosen the setscrews ① and ② and fasten the setscrew ③.



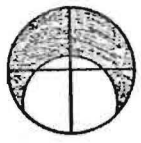
Loosen the setscrews ③ and fasten the setscrews ① and ②.

5-2 Checking and Adjustment of Telescope Center of Reflecting Mirror

Checking the Telescope Center

After the reflecting mirror has been set in position, pull out the eyepiece from the binocular head, insert the centering telescope into the binocular head, and focus the circumferential fringe of the field of the centering telescope by moving the zoom adjustment lever of the centering telescope back and forth. Here, if brightest circle is out of center, bring the bright circle to the center of the cross scale in the centering telescope only in the vertical direction (disregard the horizontal direction) in the following manner.

Adjustment procedure



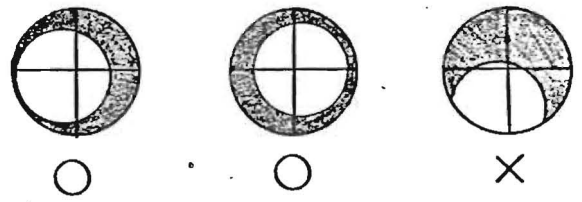
When the bright circle is positioned lower than the cross scale of the centering telescope and the lower portion of the bright circle is on the wane:

Slightly loosen the screw ④ shown in the figure for the slide guide in the Positioning Adjustment of the Surface Mirror (H-22), slightly fasten the three screws ①, ② and ③ with even torque, and slightly lower the mirror mount (A-12), that is, reflecting mirror.

When the bright circle is located above the cross scale of the centering telescope and the upper portion of the bright circle is on the wane:

Slightly loosen the three screws ①, ② and ③ in the same figure as above with even torque, slightly fasten the screw ④ and slightly raise the mirror mount (A-12), that is, surface mirror.

After the above adjustment has been made, check positional alignment in accordance with par. 5-1. If the reflecting mirror inclination is not correct, make re-positional adjustment of the reflecting mirror. As described above, the positional adjustment of the reflecting mirror and the centering adjustment by the centering telescope are related to each other and the adjustment must be made to satisfy both.



VI. Check of Unbalanced Focusing and Correction

After making the positional adjustment of the reflecting mirror and centering adjustment by the centering telescope, focus the section stage micrometer on the stage through the NWF10x or WFH10x eyepiece using the 10x objective and manipulating the coarse and fine focus control knobs, and observe the image to see if the compensation lens (A-21) is at the correct position. If the image observed is not uniform on the periphery of the field of view (if the entire field of view cannot be focused uniformly) that is, when the focusing is unbalanced, make adjustment by the following procedure to correct the unbalanced focusing and make the entire field of view uniform.

Correction of unbalanced focusing

6-1 Turn counterclockwise the changeover lever (A-25) located on the right side of the body frame (A-1) to remove it and loosen the three screws (A-7) by using the plus-face set screwdriver (Tool No. T-1-1) to remove from the body frame the optical selector table (A-5) fixed under the body frame.

6-2 Move the lens frame (A-17) on the slide guide (A-10) provided on the removed changeover mount back and forth or to right and left by loosening the four set-screws (A-19), install the optical selector table in the original position on the body frame, and observe the image at that time. Repeat this procedure until the entire image in the field of view is seen uniform.

6-3 Since this adjustment indirectly disturbs the position of the reflecting mirror, make the positional adjustment of the reflecting mirror again in accordance with the positional Adjustment of the Reflecting Mirror.

6-4 After the adjustments in pars. 6-1 through 6-3 have been made, install the changeover lever removed in par. 6-1 to the slide guide through the hole of the body frame by turning the lever clockwise.

VII. Centering Adjustment of Base Mirror

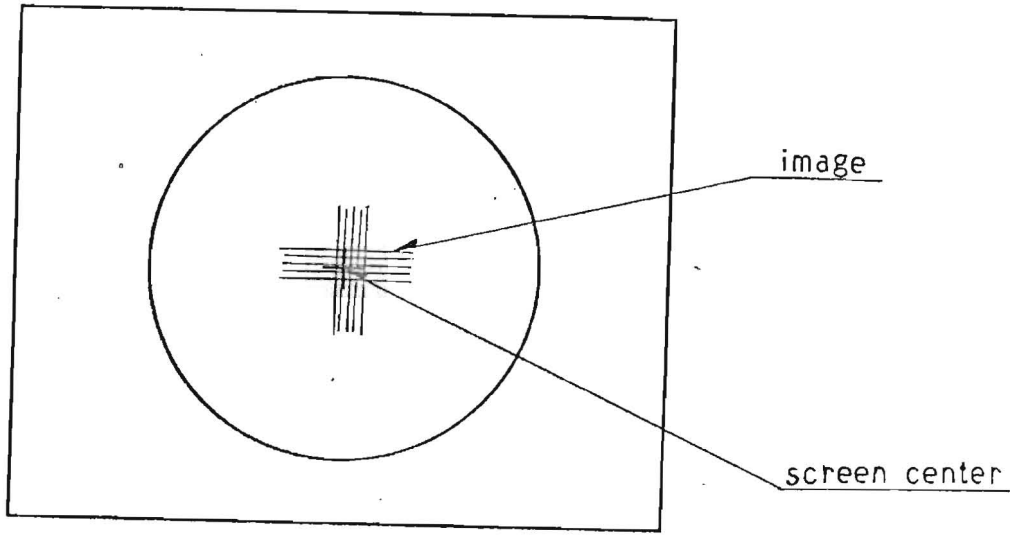
7-1 Remove the photo-box board (E-1). Use the 10x objective and insert the eyepiece (with concentric reticle) into the right sleeve of the binocular head and focus the image of the section stage micrometer by manipulating the coarse and fine focus control knobs.

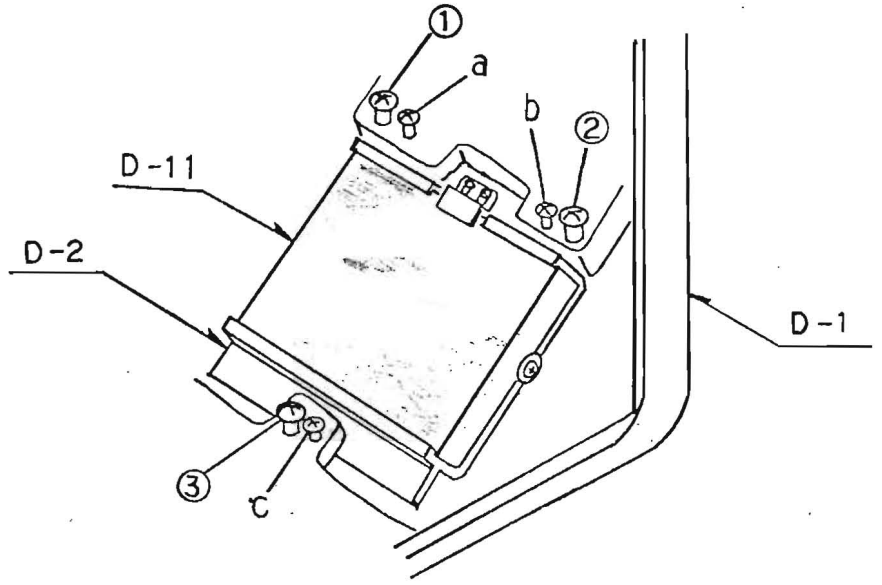
7-2 Manipulate the X-Y movement knob for the stage to align the center of the section stage micrometer with the center of the concentric reticle eyepiece.

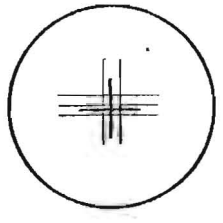
7-3 Pull the changeover lever (A-25) to change over the optical path, open the hood, and turn the light intensity control all the way.

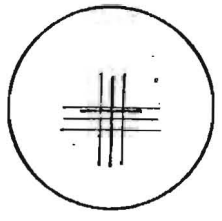
7-4 Focus the image of the section stage micrometer projected on the screen by manipulating the coarse and fine focus control knobs and see if the center of the section stage micrometer image is nearly aligned with the screen center.
If they are not aligned, tilt the base mirror using the plus-face set screwdriver (Tool No. T-1-1) to make alignment in the following manner.

The figure shows the section stage micrometer image projected on the screen.



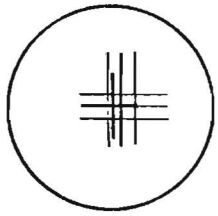




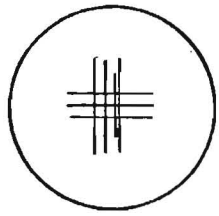


When the image center is deflected upward with respect to the screen center: Turn the screw ③ counterclockwise to loosen it, turn the screw ⓒ clockwise to fasten it, and slightly lower the lower portion of the base mirror.

When the image center is deflected downward with respect to the screen center:
Turn the screws ① and ② evenly for the same turn in the counterclockwise direction to loosen it, turn the screws a and ⓑ evenly for the same turn in the clockwise direction to fasten them, and slightly lower the upper portion of the base mirror.



When the image center is deflected to the right with respect to the screen center:
Turn the screw b counterclockwise to loosen it, turn the screw ② clockwise to fasten it, and raise the right portion of the base mirror.



When the image center is deflected to the left with respect to the screen center:
Turn the screw a counterclockwise to loosen it, turn the screw ① clockwise to fasten it, and raise the left portion of the base mirror.

VIII. Parfocal and Centering Adjustments of Photo-Eyepiece

Fasten the photo-box board (E-1) to the photo box with the bolts (E-2) using the minus-face screwdriver.
Rotate the lens turret frame (E-6) by hand and set it to 15x.
Place the section stage micrometer for reflected light on the stage and set the 10x objective. Insert the concentric reticle eyepiece into the right sleeve of the binocular head and focus the image of the section stage micrometer by manipulating the coarse and fine focus control knobs. Manipulate the X-Y movement knob of the stage to align the center of the section stage micrometer image to the center of concentric reticle eyepiece.

8-1 Positional and parfocal adjustments of the micro scale of the 15x photo-eyepiece

a. Pull the changeover lever (A-25) to the right to change over the optical path and project the image on the screen through 15x photo lens.

b. First, focus the micro scale image projected in the above paragraph. To do so, tear off the side cover (with window frame for photographic magnification) of the photo-box board using a minus-face screwdriver, rotate the 15x adjustment frame (E-12-7) of the 15x photo-eyepiece on the revolving frame (E-5) located inside the photo-box board with a finger to focus the image of the micro scale on the screen.

c. Then apply a few drops of solvent such as thinner or the like to the portion where the revolving frame (E-5) and 15x photo-eyepiece are bonded together, using tweezers (Tool No. T-1-28), to dissolve the adhesive and rotate the entire 15x photo-eyepiece by holding the frame (E-12-6) of the 15x photo-eyepiece with fingers, thereby moving it up and down to focus the image of the section stage micrometer on the screen.

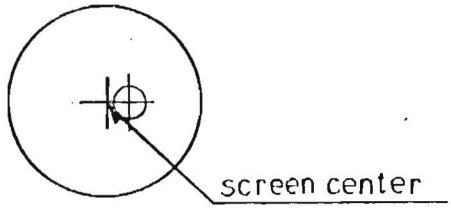
d. Then apply a few drops of solvent such as thinner or the like to the portion where the lens frame (E-12-6) and the scale frame (E-12-3) are bonded together, using tweezers, to dissolve the adhesive, and make horizontal adjustment of the micro scale (E-12-1) on the screen by rotating only the scale frame (E-12-3) while holding the lens fram (E-12-6) with fingers.

8-2 Parfocal adjustment of other photo-eyepieces (10x, 12.5x, 20x, but excluding 3.3x)

a. Rotate the lens turret to set it to the desired photo-eyepiece, apply solvent to the portion where the lens frame (E-10-3, E-11-3 or E-13-3) and the revolving frame (E-5) are bonded together to dissolve the adhesive, move the lens frame up and down by rotating it with fingers and make parfocal adjustment of the image in coincidence with the 15x photo-eyepiece.

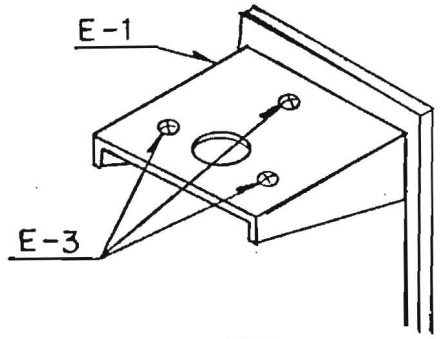
8-3 Centering adjustment

Using the 10x objective, accurately focus the image of the section stage micrometer placed on the stage through the concentric circle eyepiece and change over the optical path to the photography side by means of the changeover lever to project the image on the screen.
Find out the approximate center of the eccentricity of the images of the Ph10x - 20x objectives against the screen center and make adjustment in such a way that the center of the overall eccentricity is positioned at the screen center. The eccentricity depend on the angle at which the revolving axis plate (E-4) is fixeds to the photo box board (E-1). The adjustment is made by utilizing drift in fixing the screw (E-3) and the positional displacement small of the spring stopper (E-14) at which it is fixed to the revolving axis plate (E-4) using the screw (E-15), as described below. If the center of the overall eccentricity is only slightly deflected from the screen center, make fine adjustment by utilizing the drift in fixing the photo box board to the photo box with the bolts (E-2).

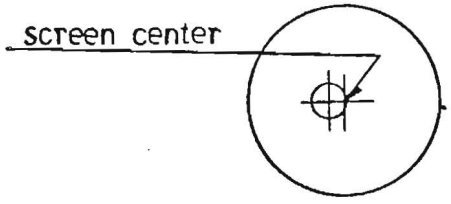


When the center of the overall eccentricity of the image is deflected to the right with respect to the screen center:

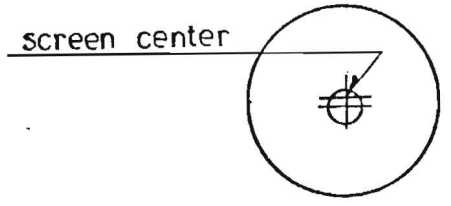
Remove the photo-box board from the photo box (D-1) by loosening the bolt (E-2) using a minus-face screwdriver and remove the dust cover using a plus-face set screwdriver. Then



slightly loosen the screw (E-3) using the plus-face screwdriver (Tool No. T-1-5) and move the entire photo-eyepiece section (E-4 to E-17) in the arrow direction by hand to bring the center of the overall eccentricity to the screen center.

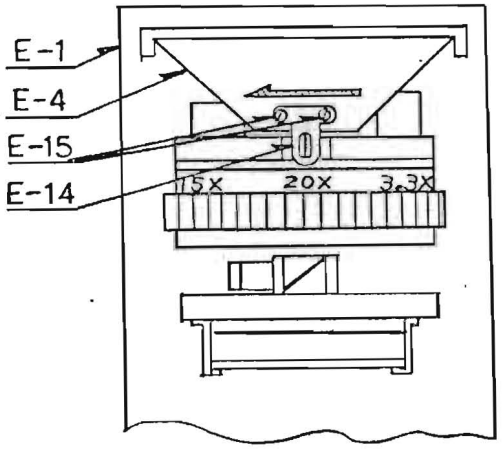


When the center of the overall eccentricity of the image is deflected to the left with respect to the screen center:

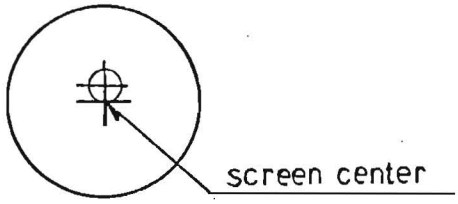


Contrary to the above-mentioned case in which the center is deflected to the right, move the entire photo-eyepiece section E-4 to E-17 in the reverse direction to the arrow direction in the above figure.

When the center of the overall eccentricity of the image is deflected downward with respect to the screen center:



As in the case of deflection to the right or left, remove the photo-box board from the photo box, loosen the two screws (E-15) using the minus-face set screwdriver (Tool No. T-1-2) to such an extent that the spring stopper (E-14) slightly moves in the arrow direction, and bring the center of the overall eccentricity of the image to the screen center by slightly changing the position at which the rotary axis plate (E-5) stops.



When the center of the overall eccentricity of the image is deflected upward with respect to the screen center:

Contrary to the above-mentioned case in which the center is deflected downward, move the spring stopper (E-14) in the reverse direction to the arrow direction.

Note: Deflection of the center of the overall eccentricity of the image in the vertical direction can sometimes be corrected by moving the photo-eyepiece E-4 to E-17.

IX. Parfocal and Centering Adjustments of 35 mm Photo-Eyepiece

Loosen the setscrew for the 35 mm camera mount mounted on the 35 mm photo tube (F-28) of the photo-box board using the minus-face set screwdriver (Tool No. T-1-2) to remove the camera mount and screw in the centering & parfocal adjustment tool (Tool No. T-2-33) into the 35 mm tube. Turn the lens turret to set it to 3.3x. Place the section stage micrometer on the stage, insert the concentric reticle eyepiece into the right sleeve of the binocular head.

Focus the image of the section stage micrometer by manipulating the coarse and fine focus control knobs, and align the image center with the eyepiece center by manipulating the X-Y movement knob for the stage.

Pull the changeover lever (A-25) to the right to change over the optical path to the photography side and turn the photo selection knob (F-31) of the photo-box board 35 mm tube counterclockwise to match the photography selection knob with the 35 mm mark on the 35 mm tube.

Pull out the eyepiece from the binocular head, insert the eyepiece into the adjustment tool (Tool No. T-2-33) mounted to the 35 mm tube to observe the image, and make parfocal and centering adjustments in the following manner.

9-1 Parfocal adjustment

If the 35 mm photo eyepiece is not parfocalized, apply a few drops of solvent such as thinner or the like to the portion where the 3.3x photo-eyepiece frame (E-9-1) of the rotary frame of the photo-box unit from which the side cover (with window frame for photographic magnification) has been teared off and the revolving frame (E-5) are bonded together, using tweezers, to dissolve the adhesive, hold the frame (E-9-1) with fingers and rotate the entire 3.3x photo-eyepiece to focus it.

9-2 Centering adjustment

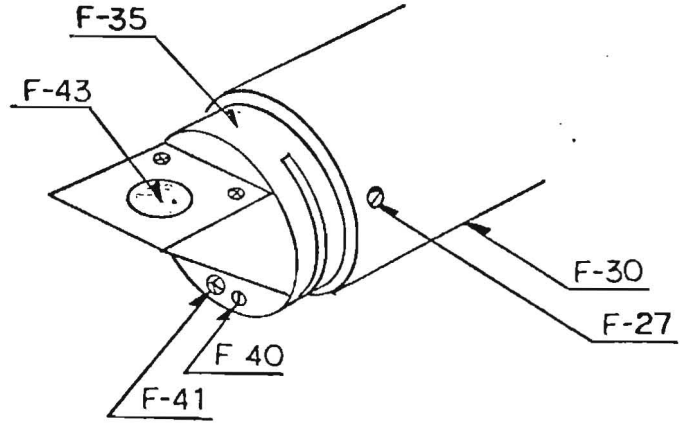
For making centering adjustment of the image center after the parfocal adjustment referred to in par. IX-1 has been made, change the prism angle by rotation of the prism (F-35) and screws (F-40, F-41) set on the prism mount to make centering adjustment as described below.

1) When the image center is deflected to the right or left with respect to the eyepiece center, remove the hood mechanism of the large size photo mechanism by sliding the hood mechanism to the right while pressing the upper and lower two toothed levers on the uppersurface of the hood frame (D-12) with both hands, and slightly loosen the setscrew (F-27) fixed to the cam tube (F-30) that will be in sight in the photo box (D-1) using a minus-face set screwdriver, until the prism mount (F-35) moves a little.
When the image center is deflected to the right with respect to the eyepiece center, put your hand into the photo box, hold the prism mount (F-35) on both sides, look into the eyepiece from the 35 mm adjustment tool (Tool No. T-2-33) and turn the prism mount clockwise while observing the image so that the image and eyepiece centers are aligned.
When the image center is deflected to the left with respect to the eyepiece center, turn the prism mount (F-35) counterclockwise and align the image and eyepiece centers. When they are aligned, fasten the setscrew (F-27) of the prism mount until the prism mount (F-35) is held in position.

Caution: Note that excessive fastening of the setscrew (F-27) makes the movement of the cam tube (F-30), that is, the photo selection knob (F-31) not smooth.

2) When the image center is deflected upward or downward with respect to the eyepiece center, loosen the two bolts (E-2) using the minus-face screwdriver to remove the photo-box board from the photo box (D-1) and adjust the adjusting screws (F-40) (F-41) of the prism mount (F-35) on the end of the cam tube.
When the image center is deflected upward with respect to the eyepiece center, slightly loosen the adjustment screw (F-41) using the plus-face set screwdriver (Tool No. T-1-1) and fasten the other screw (F-40) for the same turn as for the other. When the image center is deflected downward with respect to the eyepiece center, slightly fasten the adjustment screw (F-40) and fasten the other screw (F-41) for the same turn. Install the photo-box board to the photo box, observe the image using the centering and parfocal adjustment tool (Tool No. T-2-33) through the eyepiece, and verify

that the above adjustment has been made adequately and the image and eyepiece centers are aligned. If the adjustment is not done adequately and the centers are not aligned, remove the photo-box board from the photo box again and repeat the above-mentioned adjustment procedure until the image center and eyepiece center are aligned.



X. Fixation of Photo-Eyepiece and 35 mm Photo-Eyepiece

Upon completion of the parfocal adjustment and centering adjustment of the photo-eyepieces 10x (E-10), 12.5x (E-11), 15x (E-12), 20x (E-13), and 35 mm photo-eyepiece (E-9), fix the photo-eyepieces and revolving frame (E-5) with screw locking agent (Three Bond Co., Ltd. No. 1401). Then fix the side cover (which have window frame for photographic magnification.) of the photo-box board using double-faced adhesive tape.

XI. Adjustment of Polarizer and Analyzer

First, to observe the polarization created by the polarizer and analyzer, place the section stage micrometer on the stage, insert the eyepiece into the binocular head, and focus the image of the section stage micrometer with the 10x objective through the eyepiece by manipulating the coarse and fine focus control knobs. Then push the stop screw (H-57) of the polarizer frame (H-69) into the illuminator and then push the analyzer frame (H-46) in the mirror box (H-2) from the left side.
Observe the field of view through the eyepiece when analyser lever (H-48) of the analyzer frame is set to 90° on the scale (H-49), and the entire field of view will be seen dark.
Verify while observing the field of view that the field of view becomes the darkest when the lever (H-48) is moved from 0 to 90° of the scale (H-49). If the field of view becomes the darkest when the lever is at a position other than 90° on the scale (H-49), make adjustment to make the field of view darker when the lever (H-48) is at 90° with the polarizer and analyzer combined, as described below.

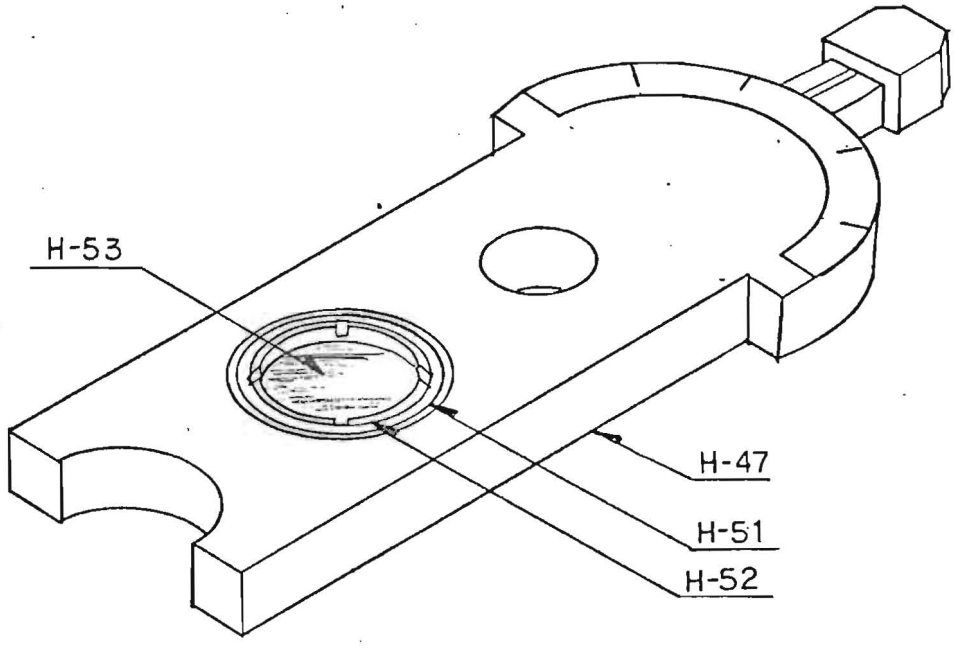
1) Turn the stop screw (H-8) provided to the mirror box (H-2) counterclockwise to loosen it and pull out the analyzer frame (H-46) from the mirror box.

2) To dissolve the adhesive, apply a few drops of solvent such as thinner or the like to the portion where the gear (H-51) mounted in the analyzer frame and the polarizer frame (H-52) are bonded together.

3) While holding the lever (H-48) to keep it at 90° with one hand, slightly turn the polarizer frame (H-52) alone clockwise or counterclockwise with tweezers, and insert the analyzer frame (H-46) into the mirror box (H-2).

4) Observing the field of view through the eyepiece, move the lever (H-48) to 0 to 90° on the scale (H-49) and verify that the field of view becomes the darkest when the lever (H-48) is at 90°. If the field of view does not become the darkest when the lever (H-48) is at 90°, repeat the procedure under par. 3) above.

5) Pull out the analyzer frame (H-46) from the mirror box (H-2) again and fix the gear (H-51) and polarizer frame (H-52) with a screw locking agent (Three Bond No.1401), insert the analyzer frame into the mirror box, and fasten the stop screw (H-8) by turning it clockwise to the extent that the analyzer frame does not come out.



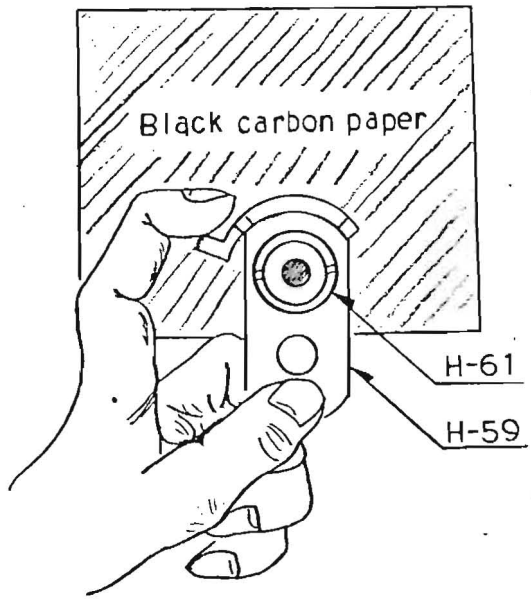
XII. Adjustment of Epitron System

To observe the bright field, first, pull out the analyzer frame (H-46), polarizer frame (H-69) and Epi frame (H-59) to the right, if they were in the optical path of the illuminator section. Then place a section stage micrometer on the stage, insert the eyepiece into the binocular head, and focus the image of the section stage micrometer with the 10x objective by manipulating the coarse and fine focus control knobs looking through the eyepiece.
Then push the Epi frame (H-59) into the illuminator, turn the lever for the polarizer of the Epi frame (H-59) upward, and set it to "0" on the angle plate (H-63). Observing the field of view through the eyepiece again, lower the lever and set it to 90° on the angle plate (H-63). Here, verify that the field of view is the darkest and that only the section lines of the section stage micrometer are luminous.
If the above-mentioned condition is caused when the lever is at a position other than 90° on the angle plate (H-63), adjust the polarizer plate of the Epi frame (H-59) in the following manner.

1) Turn the stop screw (H-57) provided to the Epi frame (H-59) counterclockwise to remove it and pull out the Epi frame (H-59) from the illuminator.

2) Loosen the two setscrews (H-67) fixed to the upper-surface and undersurface of the Epi frame (H-59) using a minus-face set screwdriver and remove the polarizer frame (H-66).

3) Set the lever of the Epi frame (H-59) to "0" on the angle plate (H-63) and look at black carbon paper or the like through the polarization plate (H-65), holding the Epi frame in the vertical direction. See the figure below.



4) Separate the lever and Epi inner frame (H-61) that are bonded with adhesive, using tweezers or the like, turn the Epi inner frame (H-61) little by little up to 360° while observing the polarizer plate (H-65) and pressing the lever with a finger, and there will be seen a dark portion. When the portion becomes the darkest, fix the lever and the polarizer inner frame (H-61) with a screw locking agent.

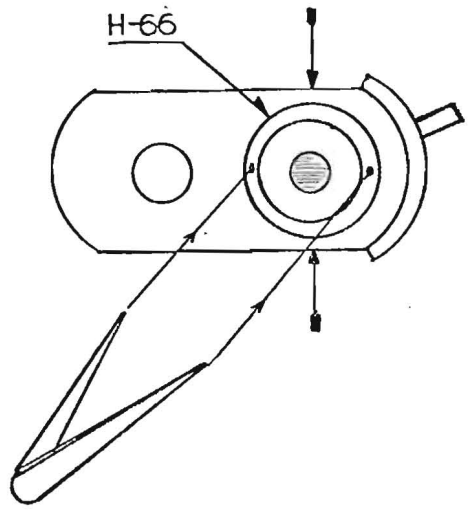
5) Hold the Epi frame in the horizontal direction this time, move the lever to set it to 90° on the angle plate (H-63), and fit the polarizer frame (H-66) removed in par. 2) above into the Epi frame.

6) Apply tweezers to the two holes in the polarizer frame (H-66) while pressing the lever to maintain the position of 90°, rotate the polarizer frame little by little up to 360°, and there will be

a position where the polarizer plate turns out dark for a moment. Find out this position and set the polarizer frame (H-66) by fastening the two setscrews for the Epi frame loosened under par. 2), using the minus-face set screwdriver.

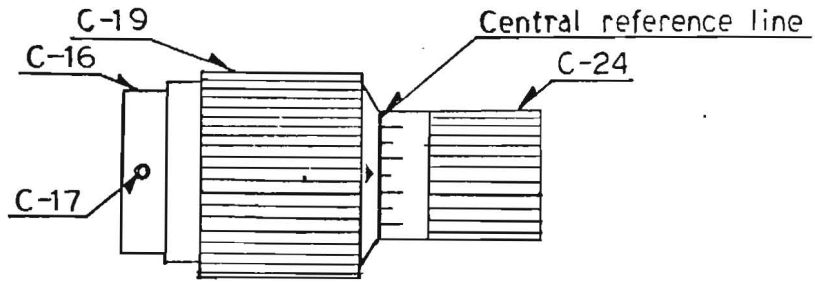
7) Insert the Epi frame (H-59) into the optical path of the illuminator section and slowly move the Epi frame lever (H-60) from 0 to 90 of the angle frame (H-63). And verify that the field of view becomes the darkest when the lever is at 90° and that only the section lines in the image are luminous. If the aforementioned condition is caused when the lever is at a position other than 90°, pull out the Epi frame (H-59) from the illuminator to the right, loosen the two setscrews (H-67) on the uppersurface and undersurface of the Epi frame (H-59) using a minum-face set screwdriver, and repeat the procedures under pars. 6) and 7).

8) Upon completion of the adjustment mentioned above, fasten the Epi frame (H-59) inserted into the illuminator by turning the stop screw (H-57) clockwise.



XIII. Positional Adjustment of Stage Height

Turn the fine focus knob (C-24) clockwise using right hand until it comes to a stop. There, reverse the knob, that is, turn it counterclockwise, by about 5 to 6 turns up to a point where the central reference line on the fine focus knob (C-24) can be seen. (By 5 to 6 turns is meant about half the total number of rotations)



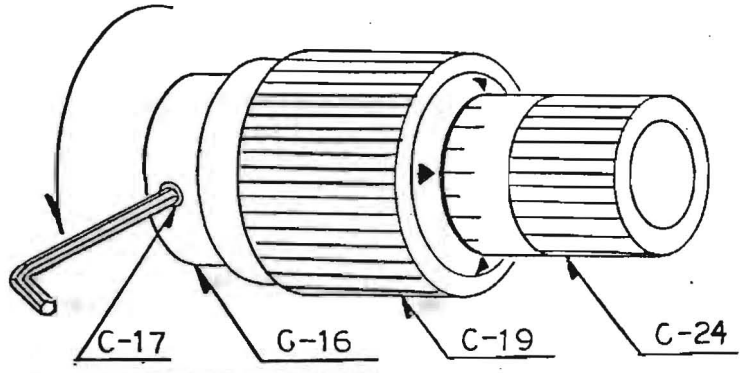
1) Adjustment of Lower End

a. Loosen the two stop screws (C-17) shown in the figure using the hexagon wrench (Tool No. T-1-24) until the adjustment rings moves freely.

b. Place the stage insert plate on the stage and then the section stage micrometer thereon, insert the eyepiece into the right sleeve of the binocular head, and focus the image of the section stage micrometer with the 10x objective through the eyepiece by manipulating the coarse focus control knob.

c. Rotate the adjustment ring (C-16) counterclockwise until it comes to a stop and fasten the two stop screws there using the hexagon wrench (Tool No. T-1-24). To Turn the adjustment ring (C-16), insert the hexagon wrench (Tool No. 6-1-24) into one of the two stop screws (C-17) and use the hexagon wrench as a lever to rotate the adjustment ring (C-16).

Note: Be careful not to rotate the coarse focus control knob together with the adjustment ring when it comes to a stop.



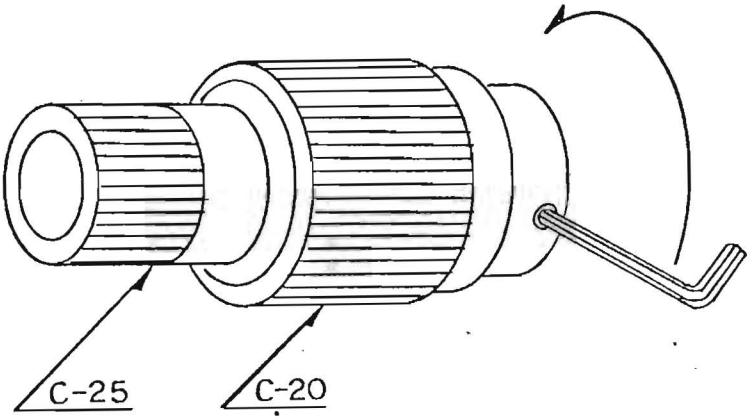
2) Adjustment of upper end

For adjustment of the upper end, do it with the adjustment ring on the left side of the body (the side on which the coarse and fine focus control knobs have no graduation).

a. Loosen the two stop screws (C-17) of the adjustment ring (C-16) on the left side of the body using the hexagon wrench until the adjustment ring moves freely.

b. Rotate the coarse focus control knob counterclockwise by 5 1/2 turns from the lower end stop position referred to in par. 1) above using your right hand to raise the stage and arm (B-5).

c. Rotate the adjustment ring (C-16) counterclockwise using the hexagon wrench as a lever using your left hand in the same manner as in par. 1) c until the ring comes to a stop, and fasten the two stop screws (C-17) there.


C-25
C-20

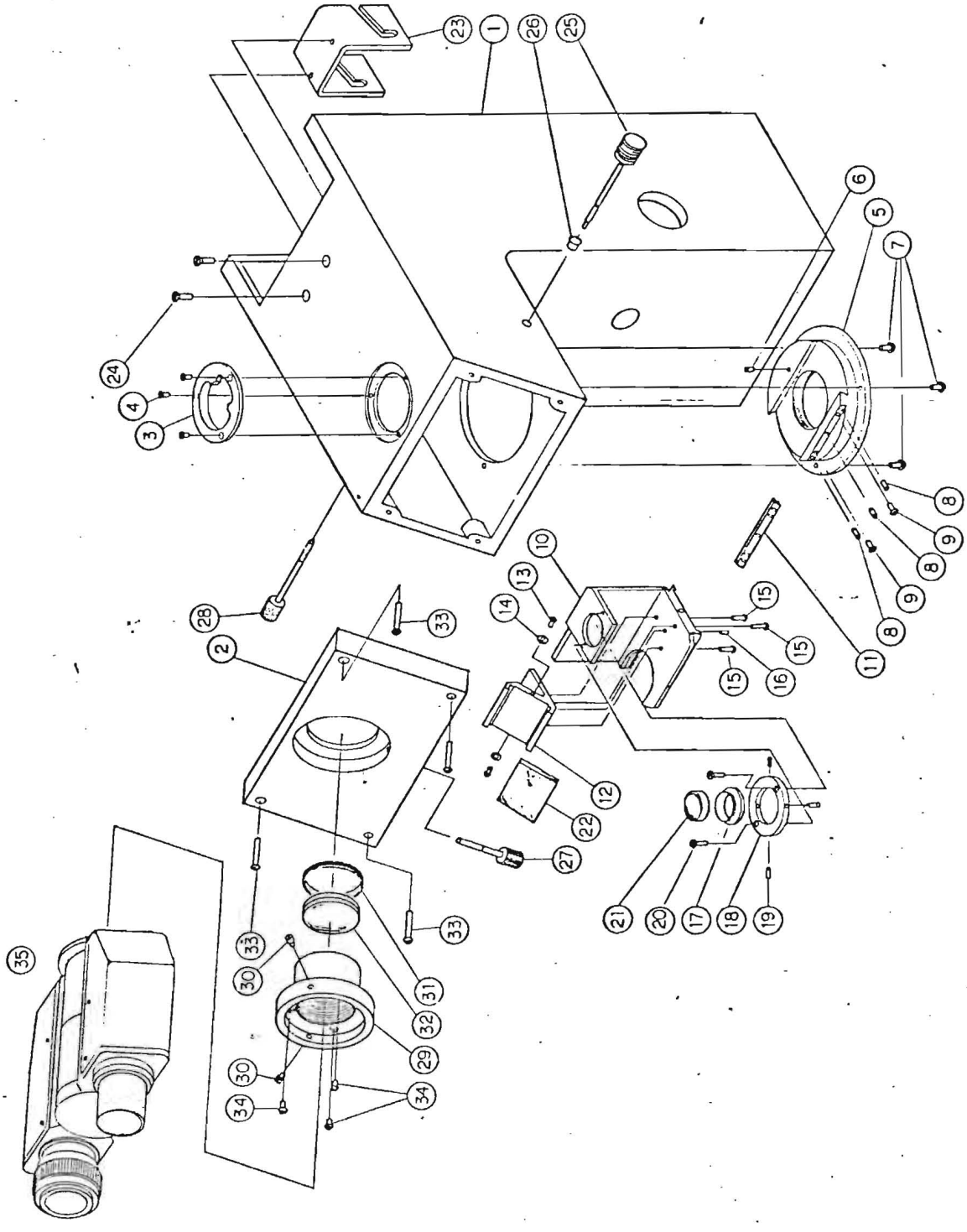
XIV. Centering Adjustment of Stage

1) Place the pinhole gauge (Tool No. T-2-23) on the stage and insert the concentric reticle eyepiece into the right sleeve of the binocular head. Looking through the eyepiece, focus the 10x objective by manipulating the coarse and fine focus control knobs.

2) Manipulate the X and Y knobs of the stage to align the upper, middle and lower stage plates.

3) Loosen the four fixing screws that fix the stage from under the arm (B-5) using a minus-face screwdriver, move the entire stage while looking at the pinhole through the eyepiece so that the pinhole in the gauge (T-2-23) on the stage is aligned with the center of the eyepiece by means of the longitudinal and transverse play of the stage caused by loosening and fasten the four fixing screws at a postion where the eyepiece center and pinhole are aligned, using a minus-face screwdriver, to fix the stage.

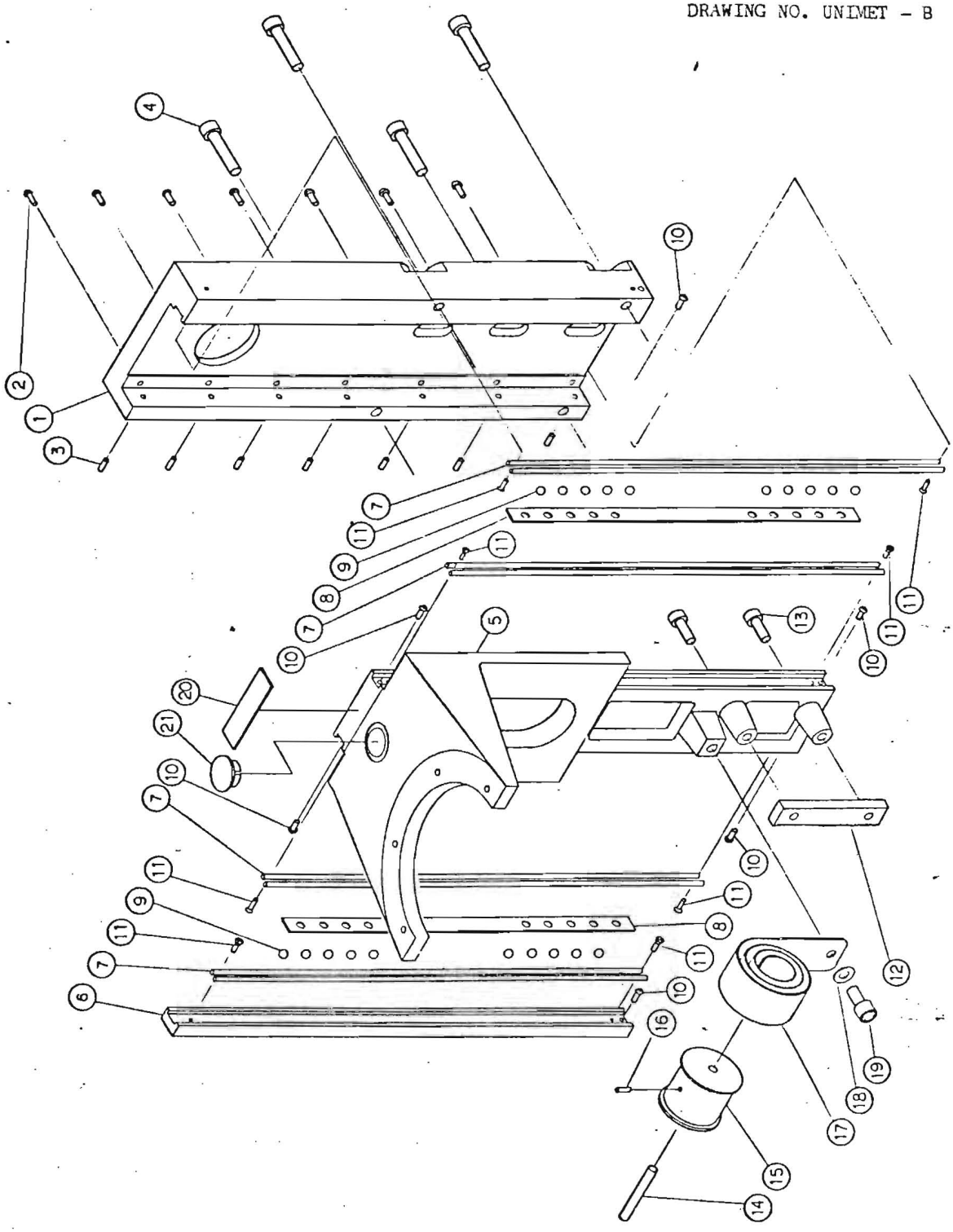
MICROSCOPE BODY SECTION
DRAWING NO. UNIMET - A



UNIMET-A, MICROSCOPE BODY SECTION

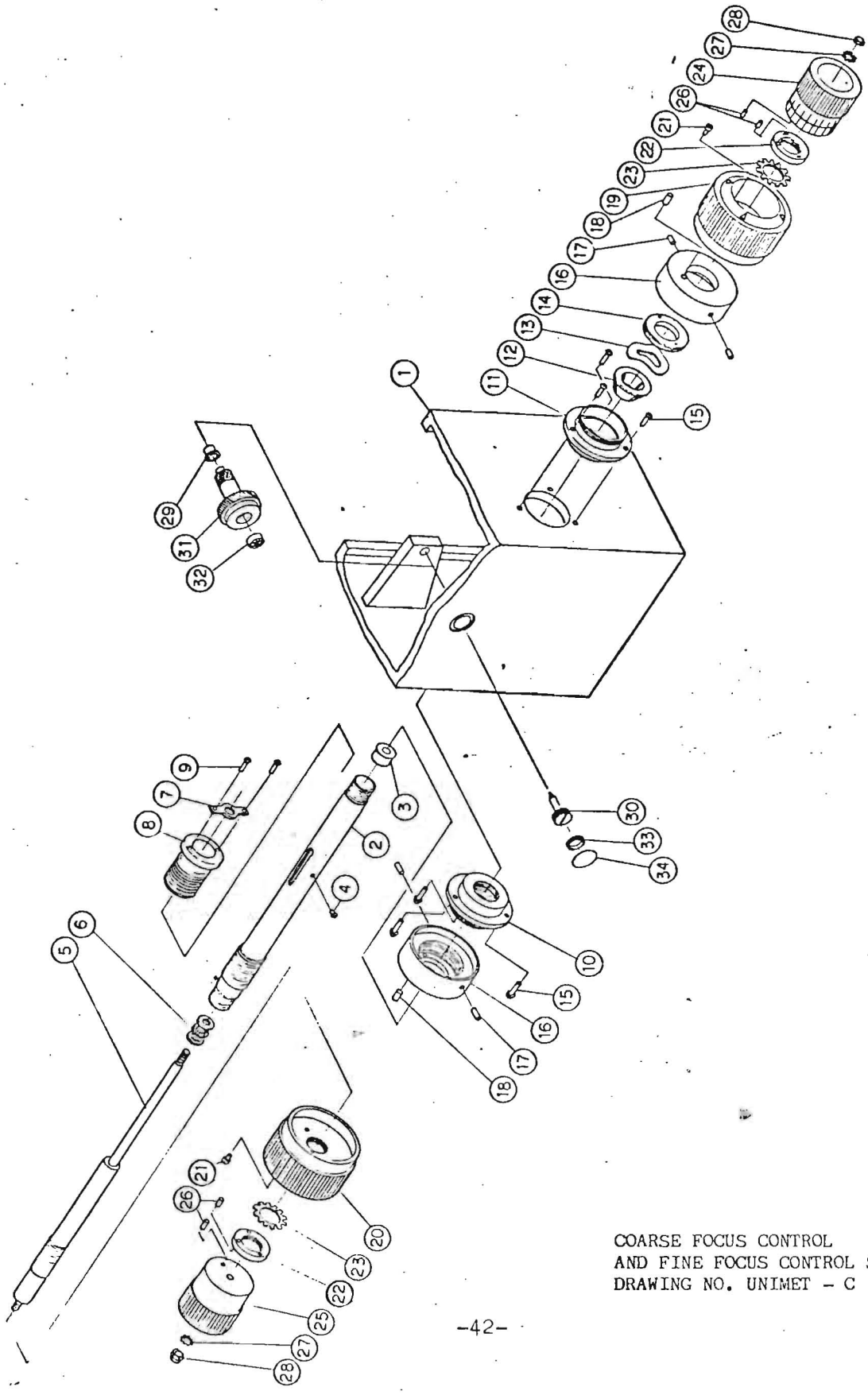
Code No.	Part Name	Drawing No.	Q'ty
UNIMET-A-1	Body frame	MJ-BO-1	1
" A-2	Front plate	MJ-BO-2	1
" A-3	HL mount	MJ-BO-4	1
" A-4	Screw "O" type		3
" A-5	Optical selector table	MJ-BO-6	1
" A-6	Knock pin	ϕ2 x 4	1
" A-7	Pan-head screw	Na 3006	3
" A-8	Centering screw	Nh 2004	3
" A-9	Pan-head screw	Na 2006	2
" A-10	Slide guide	MJ-BO-7	1
" A-11	Rail plate	MJ-BO-8	1
" A-12	Mirror table	MJ-BO-9	1
" A-13	Pan-head screw	Na 1703	2
" A-14	Washer	ϕ2	2
" A-15	Pan-head screw	Na 2010	3
" A-16	Centering screw	Nh 2004	1
" A-17	Lens frame	MJ-BO-11	1
" A-18	Outer lens frame	MJ-BO-37	1
" A-19	Setscrew	Ng 2004	4
" A-20	Flat head screw	Va 2009	2
" A-21	Subsidiary lens	MJ-Bi-L1	1
" A-22	Reflecting mirror	MJ-Bi-G-1	1
" A-23	Spring mount	MJ-Bi-12	1
" A-24	Countersunk screw	Nb 3008	2
" A-25	Light changeover lever	MJ-BO-13	1
" A-26	Eyelet		1
" A-27	Fixing Binocular screw	MJ-BO-14	1
" A-28	Fixing screw	MJ-BO-15	1
" A-29	BC mount A	MJ-BO-3	1
" A-30	" " B	MJ-BO-3	2
" A-31	Screw ring	Sa 330a	1
" A-32	Subsidiary lens	MJ-Bi-L2, L3	1 ea.
" A-33	Pan-head screw	Na 3020	4
" A-34	" " "	Na 2606	3
" A-35	Binocular head	Bi-17M	1 set

BRACKET SECTION
DRAWING NO. UNIMET - B



UNIMET-B, BRACKET SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-B-1	Rectangular frame	MJ-BR-1	1
" B-2	Pan-head screw	Na 3012	7
" B-3	Adjusting screw	Nh 3010	7
" B-4	Hexiagonal head bolt	Ne 6030	4
" B-5	Arm	MJ-BR-2	1
" B-6	Slide guide	MJ-BR-3	1
" B-7	Wire	MJ-BR-4	8
" B-8	Retainer	MJ-BR-5	2
" B-9	Steel ball	ϕ5	20
" B-10	Pan-head screw	Na 3006	6
" B-11	Countersunk-head screw	Nb 2005	8
" B-12	Lack gear	MJ-BR-6	1
" B-13	Hexiagonal head bolt	Ne 5015	2
" B-14	Spring drum	MJ-BR-10	1
" B-15	Spring drum center	MJ-BR-10	1
" B-16	Hexiagonal head bolt	Nf 3010	1
" B-17	Winding spring	MJ-BR-11	1
" B-18	Washer	ϕ10.5 x ϕ11.5 x t0.8	2
" B-19	Hexiagonal head bolt	Ne 6012	1



COARSE FOCUS CONTROL
AND FINE FOCUS CONTROL SECTION
DRAWING NO. UNIMET - C

UNIMET-C, COARSE FOCUS CONTROL AND FINE FOCUS CONTROL SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-C-1	Body frame	MJ-BO-1	1
" C-2	Coarse focus shaft	MJ-BO-17	1
" C-3	Fine focus bush	MJ-BO-18	1
" C-4	Pan-head screw	Na 2002	1
" C-5	Fine focus shaft	MJ-BO-19	1
" C-6	Thrust bearing	T5-10	1 set
" C-7	Coupling metal	MJ-BO-20	1
" C-8	Threaded tube	MJ-BO-21	1
" C-9	Pan-head screw	Na 2006	2
" C-10	Coarse focus flange B	MJ-BO-22	1
" C-11	" " " A	MJ-BO-23	1
" C-12	Coarse focus bush	MJ-BO-24	1
" C-13	Corrugated washer	ϕ15 x ϕ24 x t0.5	1
" C-14	Bush ring	MJ-BO-25	1
" C-15	Pan-head screw	Na 3008	6
" C-16	Adjustment ring	MJ-BO-26	2
" C-17	Stop screw	Nf 3006	4
" C-18	Knock pin	ϕ3 x 6	2
" C-19	Coarse focus knob (graduated)	MJ-BO-27	1
" C-20	Coarse focus knob (no graduated)	MJ-BO-27	1
" C-21	Setscrew	Vf 4002	2
" C-22	Coarse focus shaft nut	MJ-BO-29	2
" C-23	Crown washer	ϕ13 x ϕ22.5 x t1	2
" C-24	Fine focus knob (graduated)	MJ-BO-30	1
" C-25	Fine focus knob (no graduated)	MJ-BO-30	1
" C-26	Knok pin	ϕ2 x 4	4
" C-27	Crown washer	ϕ4.3 x ϕ8.5 x t1	2
" C-28	Cap nut	M4	2
" C-29	Bush for gear shaft	MJ-BO-32	1
" C-30	Pivot shaft	MJ-BO-34	1
" C-31	Transmission gear	MJ-BO-35	1
" C-32	Angular contact bearing	AC3-9	1
" C-33	Screw ring	Sa 100A	1
" C-34	Pivot coverplate	MJ-BO-36	1

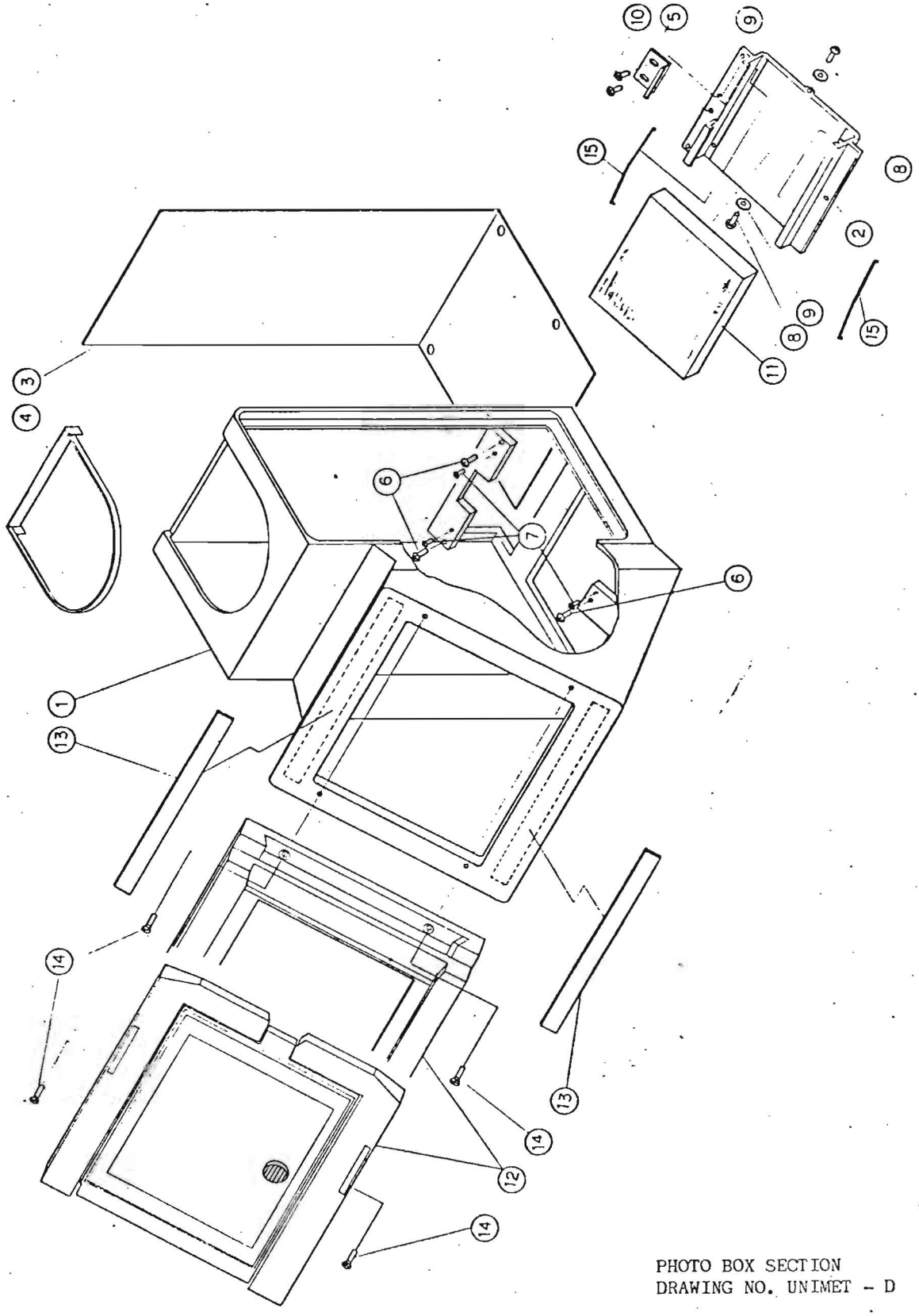
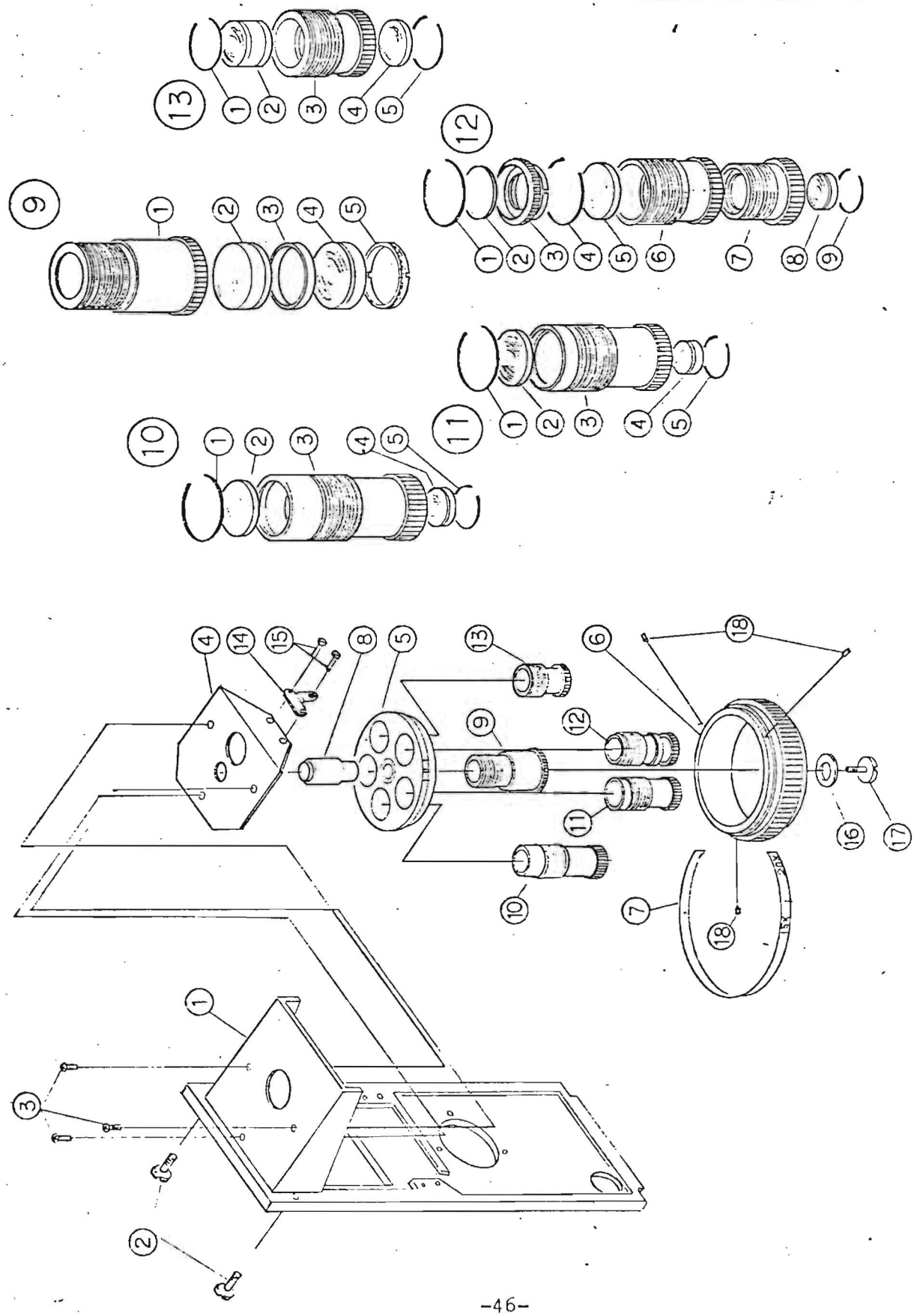


PHOTO BOX SECTION
DRAWING NO. UNIMET - D

UNIMET-D, PHOTO BOX SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-D-1	Photo box	MJ-PL-1	1
" D-2	Mirror table	MJ-PL-2	1
" D-3	Photo box cover	MJ-PL-5	1
" D-4	Light shielding cloth	MJ-PL-6	1
" D-5	Base mirror fixture	MJ-PL-7	1
" D-6	Pan-head screw	Na 3010	3
" D-7	Pan-head screw	Na 2012	3
" D-8	Pan-head screw	Na 3008	2
" D-9	Washer	ϕ4.5 x ϕ10 x t0.8	2
" D-10	Pan-head screw	Na 3006	2
" D-11	Base mirror	MJ-PL-G1	1
" D-12	Hood frame	MPX-45S	1
" D-13	Light shielding cloth		2
" D-14	Countersunk-head screw	Nb 3010	4
" D-15	Spring	MJ-PL-3	2

PHOTO EYEPIECE SECTION
DRAWING NO. UNIMET - E



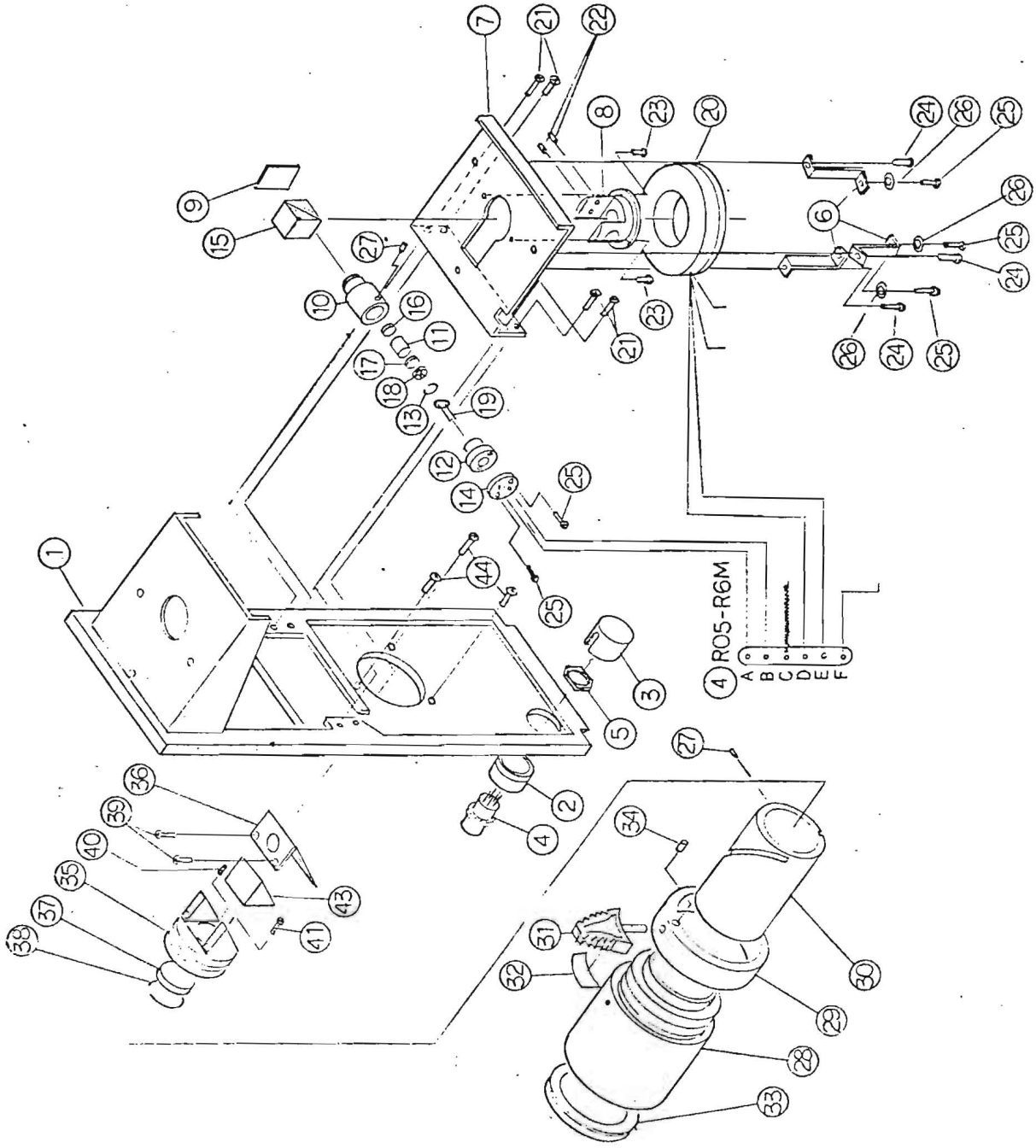
UNIMET-E, PHOTO EYEPIECE SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-E-1	Photo box board	MJ-PL-11	1
" E-2	Fitting bolts	MJ-BR-15	2
" E-3	Pan-head screw	Na 3005	3
" E-4	Photo revolving axis plate	MJ-PL-12	1
" E-5	Photo revolving frame	MJ-PL-13	1
" E-6	Lens turret frame	MJ-PL-14	1
" E-7	Magnification seal	MJ-PL-15	1
" E-8	Photo revolving shaft	MJ-PL-27	1
" E-9-1	Lens frame for 3X	MJ-PL-18	1
" E-9-2	Photoeyepiece lens L1, L2	MJ-3.3X-L1, L2	1 set
" E-9-3	Spacer ring for 3.3X	MJ-PL-19	1
" E-9-4	Photoeyepiece lens L3, L4 for 3X	MJ-3.3X-L3, L4	1 set
" E-9-5	Screw ring	Sa 200a	1
" E-10-1	Lens ring	MJ-PL-21A	1
" E-10-2	Photoeyepiece lens for 10X	MPX-Ph10X-L3	1
" E-10-3	Lens frame for 10X	MJ-PL-20	1
" E-10-4	Photoeyepiece lens for 10X	WS3-Ph10X-L1, L2	1 set
" E-10-5	Screw ring	MJ-PL-21C	1
" E-11-1	Screw ring	MJ-PL-21A	1
" E-11-2	Photoeyepiece lens for 12.5X	MPX-Ph12.5X-L3	1
" E-11-3	Lens frame for 12.5X	MJ-PL-22	1
" E-11-4	Photoeyepiece lens for 12.5X	MPX-Ph12.5X-L1, L2	1 set
" E-11-5	Lens ring	MJ-PL-21C	1
" E-12-1	Lens ring	MJ-PL-21A	1
" E-12-2	Micrometer scale	MPX-PL-G1	1
" E-12-3	Scale frame	MJ-PL-25	1
" E-12-4	Lens ring	MJ-PL-21A	1
" E-12-5	Photoeyepiece lens for 15X	Ph micro 15X-G3	1
" E-12-6	Lens frame for 15X	MJ-PL-23	1
" E-12-7	Ph15X adjustment frame	MJ-PL-24	1
" E-12-8	Photoeyepiece lens for 15X	Ph micro 15X-G1, G2	1 set
" E-12-9	Lens ring	MJ-PL-21C	1
" E-13-1	Lens ring	MJ-PL-21b	1
" E-13-2	Photoeyepiece lens for 20X	K15X-G2, G3, G2	1 set
" E-13-3	Lens frame for 20X	MJ-PL-26	1
" E-13-4	Photoeyepiece lens for 20X	K15X-G1	1
" E-13-5	Lens ring	MJ-PL-21b	1

* to be continued *

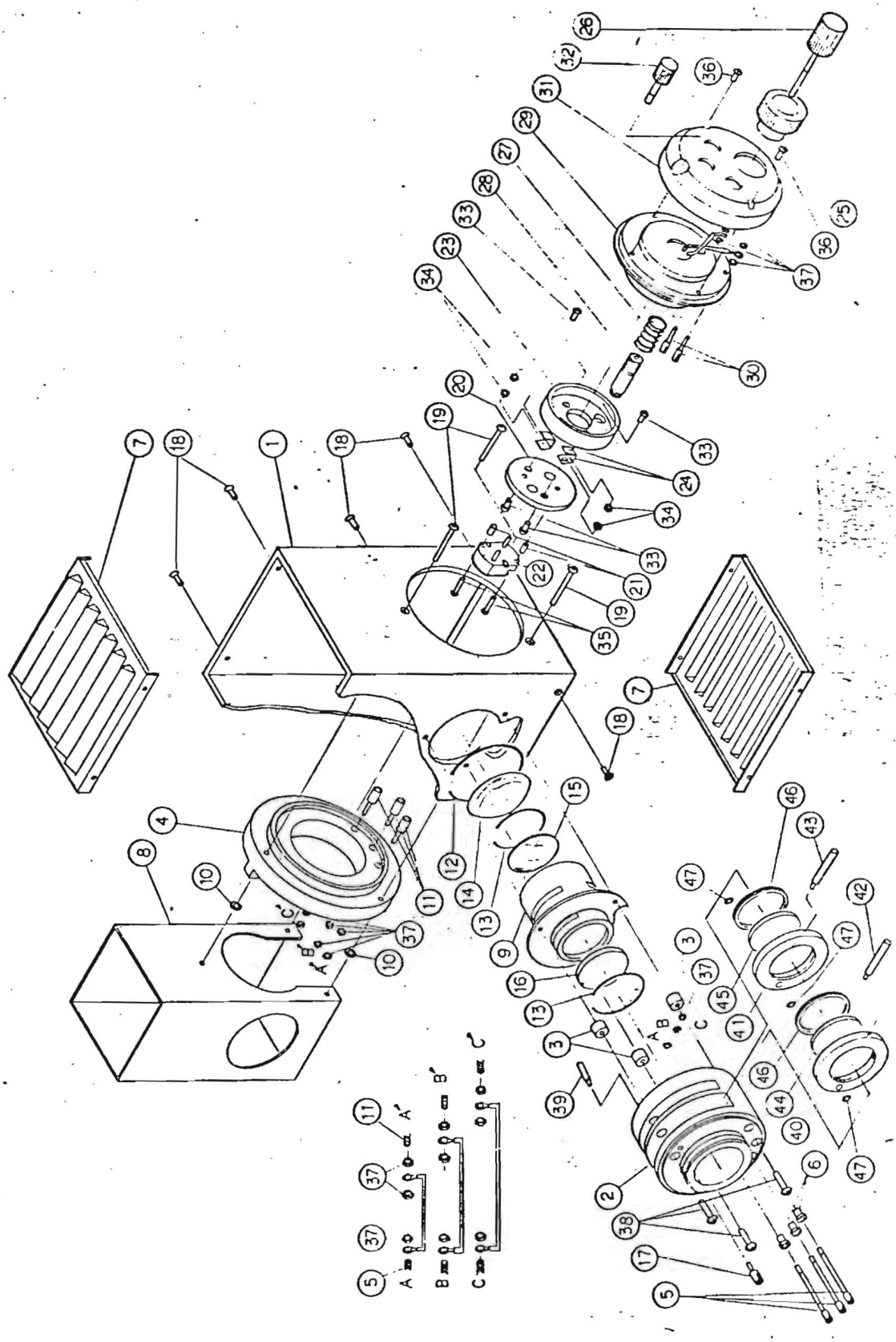
Code No.	Part Name	Drawing No.	Q'ty
UNIMET-E-14	Spring stopper	3R-8	1
" E-15	Flat fillester headscrew	Vb 1704	2
" E-16	Washer	3R-6	1
" E-17	Flat headscrew	3R-7	1
" E-18	Set screw	Ng 2003	3

35mm PHOTOGRAPHY
AND ELECTRIC SHUTTER SECTION
DRAWING NO. UNIMET - F



Code No.	Part Name	Drawing No.	Q'ty
UNIMET-F-36	Prism cover	MJ-PL-45	1
" F-37	3.3X photo lens	MJ 3.3X-L5, L6	1 set
" F-38	Fixing ring	MJ-UI-9	1
" F-39	Pan-head screw	Na 2004	2
" F-40	Adjusting screw	Nh 2004	1
" F-41	Pan-head screw	Na 2608	1
" F-42			
" F-43	Rectangle prism	UM-Hi-G1	1
" F-44	Pan-head screw	Na 3008	3

REFLECT-LIGHT
ILLUMINATOR SECTION
DRAWING NO. UNIMET - G



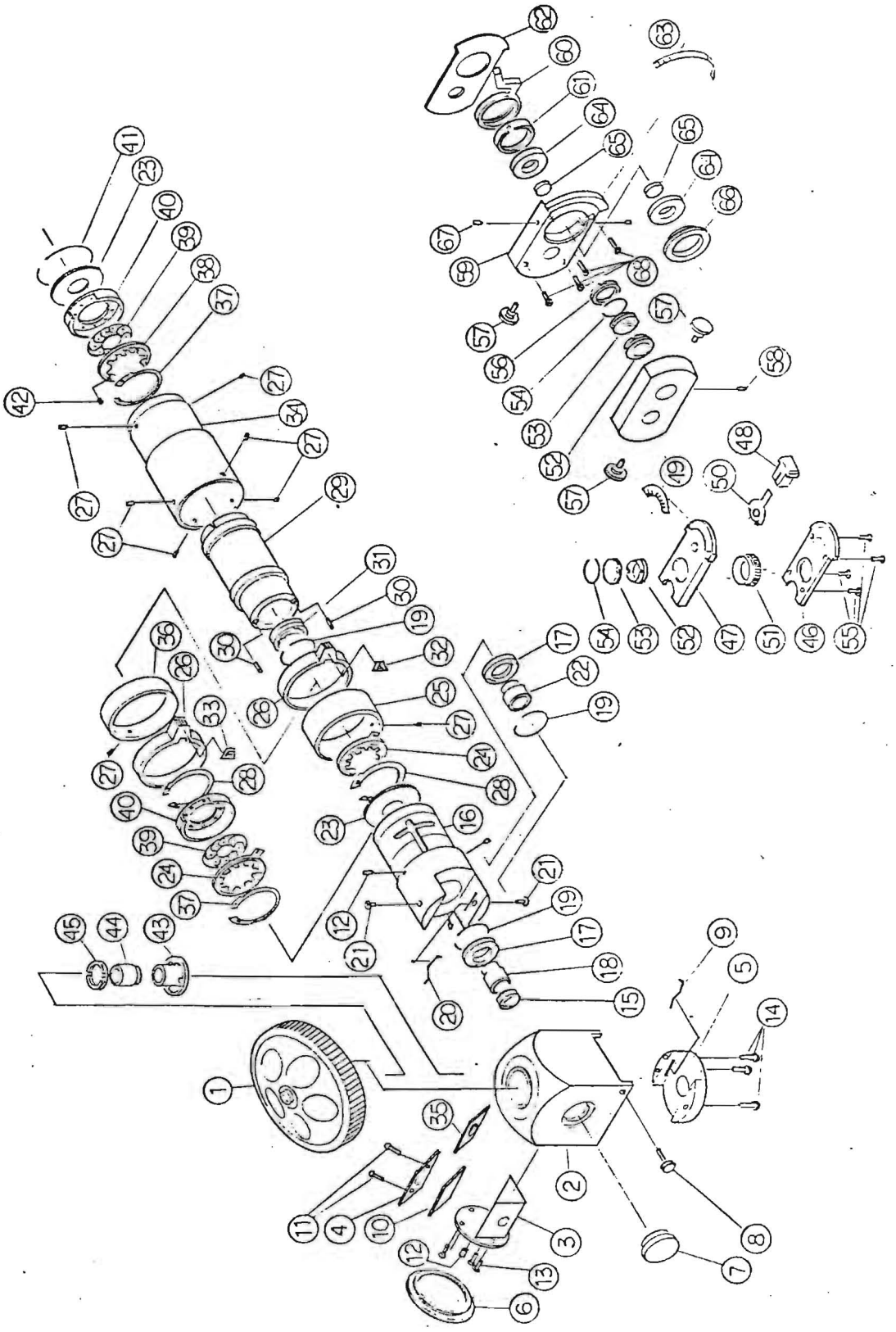
UNIMET-G, REFLECT LIGHT ILLUMINATION SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-G-1	Lamp house frame	MJ-HL-1	1
" G-2	Filter holder	MJ-HL-2	1
" G-3	Heat absorbing cylindric washer	MJ-HL-3	3
" G-4	Socket flange	MJ-HL-4	1
" G-5	Conductive pin	MJ-HL-5	3
" G-6	Insulating bush	MJ-HL-6	3
" G-7	Ventilating plate	MJ-HL-7	2
" G-8	Heat shielding metal tube	MJ-HL-8	1
" G-9	Condenser lens frame A	MJ-HL-9	1
" G-10	Asbestos washer	MJ-HL-14	3
" G-11	Conductive case	MJ-BR-9	3
" G-12	Wire ring	MJ-HL-13	1
" G-13	Wire ring B	MJ-UI-13	2
" G-14	Unspherical lens	MJ-HL-L1	1
" G-15	Convex lens	NX-L1	1
" G-16	Heat absorbing filter	UM-FiG1	1
" G-17	Guide screw	MS-25-21a	1
" G-18	Fixing screw	Nb 2006	8
" G-19	pan-head screw	Na 3020	3
" G-20	Lamp socket table	MJ-SH-1	1
" G-21	Heat absorbing Cylindric washer	MJ-SH-2	2
" G-22	Lamp socket plate	HS-6T	1
" G-23	Moving frame	MJ-SH-3	1
" G-24	Spring	MJ-HM-6	2
" G-25	Adjustment knob A	MJ-HM-7	1
" G-26	Adjustment knob B	MJ-HM-8	1
" G-27	Coiled spring	MJ-HM-9	1
" G-28	Moving shaft	MJ-HM-11	1
" G-29	Frame	MJ-SH-4	1
" G-30	Conductive pin	MJ-SH-6	2
" G-31	Socket cover	MJ-SH-7	1
" G-32	Fixing knob	MJ-SH-8	1
" G-33	Pan-head screw	Na 2605	4
" G-34	Nut	M2.6	4
" G-35	Pan-head screw	Na 2012	2

* to be continued *

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-G-36	Pan-head screw	Na 2606	2
" G-37	Nut	M2	13
" G-38	Pan-head screw	Na 3015	3
" G-39	Pin screw	MJ-HL-12	1
" G-40	Filter frame A	MPX-1-111	1
" G-41	Filter frame B	MPX-1-111	1
" G-42	Filter lever (green)	MPX-1-112	1
" G-43	Filter lever (blue)	MPX-1-112	1
" G-44	Green filter	UM-FiG	1
" G-45	Blue filter	UM-FiG	1
" G-46	Screw ring	Sa 310A	2
" G-47	Washer	ϕ4 x ϕ7 x t0.4	3

LIGHT TRANSMISSION SECTION
DRAWING NO. UNIMET - H



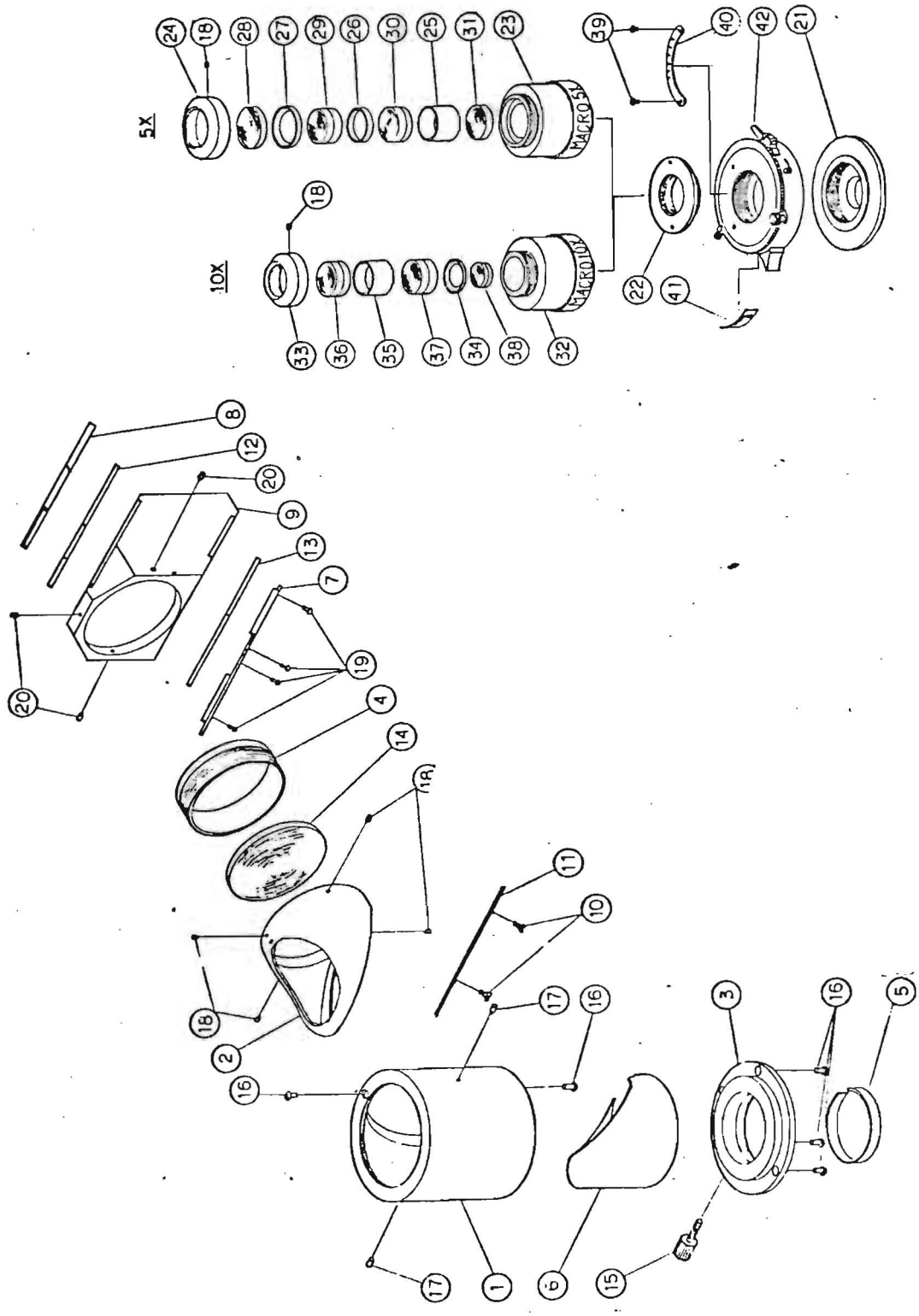
UNIMET-H, LIGHT TRANSMISSION SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-H-1	Revolving nosepiece	5R	1
" H-2	Mirror box	MJ-UI-1	1
" H-3	Mirror mount	MJ-UI-2	1
" H-4	Mirror fixture	MJ-UI-3	1
" H-5	Mirror mount	MJ-UI-4	1
" H-6	Mirror side cover	MJ-UI-22	1
" H-7	Arm cap	MJ-BR-14	1
" H-8	Stop screw	MJ-BO-38	1
" H-9	Spring	MJ-UI-20	1
" H-10	Plane glass reflector	ME-BI-G1	1
" H-11	Pan-head screw F/BrightFIELd	Na 2002	2
" H-12	Adjusting screw	Nh 2003	4
" H-13	Flat fillester head screw	Va 2009	3
" H-14	Pan-head screw	Na 2608	3
" H-15	Sub-condenser lens	MJ-SL-1, 2	1 set
" H-16	Field diaphragm lever	MJ-UI-6	1
" H-17	Transparent acryle ring	MJ-UI-7	2
" H-18	Lens frame	MJ-UI-8	1
" H-19	Wire ring A	MJ-UI-9	2
" H-20	Spring	MJ-UI-20	1
" H-21	Fixing screw	Nb 3008	2
" H-22	Shielding tube	MJ-UI-17	1
" H-23	Plane diaphragm	MJ-UI-19	2
" H-24	Gutter ring	MJ-UI-11A	1
" H-25	Cover ring	MJ-BI-2	1
" H-26	Diaphragm lever	MJ-UI-12	1
" H-27	Setscrew	Ng 2002	9
" H-28	Junk ring 32		2
" H-29	Aperture diaphragm tube	MJ-UI-16	1
" H-30	Knock pin	ϕ1.5 x 8	2
" H-31	Sub-condenser lens	MJ-SL-3, 4	1 set
" H-32	Mark plate	MJ-UI-26A	1
" H-33	Mark plate	MJ-UI-26B	1
" H-34	Coupler	MJ-UI-14	1
" H-35	Plane glass reflector F/Darkfield	ME-UI-G1	1

* to be continued *

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-H-36	Covering	MJ-UI-15	1
" H-37	Junk ring 28		2
" H-38	Gutter ring	MJ-UI-11B	1
" H-39	Vane	MPX-M330	20
" H-40	Diaphragm frame	MJ-UI-10	2
" H-41	Wire ring B	MJ-UI-13	1
" H-42	Pin	MJ-UI-21	1
" H-43	Shielding sleeve	MPX-IC-336	1
" H-44	Shielding tube (A)	MPX-IC-304	1
" H-45	Screwed ring	Sa 215 BS	1
" H-46	Analyzer frame	MJ-UI-23	1
" H-47	Analyzer cover	MJ-UI-24	1
" H-48	Analyzer lever	MJ-UI-25	1
" H-49	Graduated scale	MJ-UI-27	1
" H-50	Analyzer gear lever	MJ-UI-28	1
" H-51	Cylindrical gear	MPX-TU-120	1
" H-52	Polarizer frame	MPX-TU-123	2
" H-53	Polarizer	MPX-TU-G3, G4	2 sets
" H-54	Wire ring	MPX-TU-124	2
" H-55	Countersunk screw	Nb 1704	4
" H-56	Screwed ring	Sa 160a	1
" H-57	Stop screw with step	Vj 2001	2
" H-58	Setscrew	Ng 1706	1
" H-59	Epi frame	MJ-PB-1	1
" H-60	Polarizer frame	MJ-PB-2	1
" H-61	Epi inner frame	MJ-PB-3	1
" H-62	Polarizer cover plate	MJ-PB-4	1
" H-63	Angle graduated plate	MJ-PB-5	1
" H-64	Transparent acryle ring	MPX-M332	2
" H-65	Polarizer plate	MPX-M300G2a, G4a	2 sets
" H-66	Polarizer frame	MPX-M309a	1
" H-67	Setscrew	Ng 2003	2
" H-68	Countersunk screw	Nb 1708	4
" H-69	Polarizer frame	MJ-PA-1c	1

LOW POWER ATTACHMENT SECTION
DRAWING NO. UNIMET - I



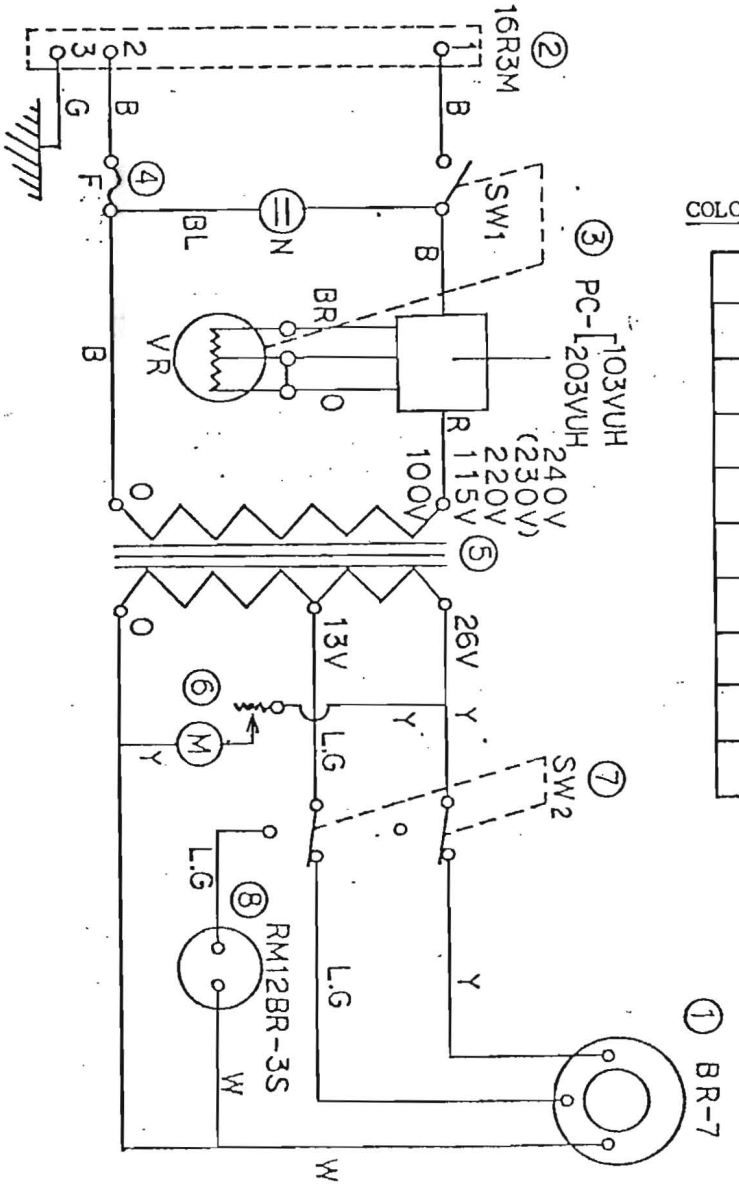
UNIMET-I, LOW POWER ATTACHMENT

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-I-1	Illumination box	MJ-MC-1	1
" I-2	Mirror frame	MJ-MC-2	1
" I-3	Coupling frame	MJ-MC-3	1
" I-4	Screwed ring	MJ-MC-4	1
" I-5	Fitting ring	MJ-MC-8	1
" I-6	Light shield cloth	MJ-MC-10	1
" I-7	Lower cover for mirror	MJ-MC-14	1
" I-8	Upper cover for mirror	MJ-MC-15	1
" I-9	Mirror box	MJ-MC-16	1
" I-10	Fixing screw with step	MJ-MC-17	1
" I-11	Plane glass reflector	MJ-MC-G1	1
" I-12	Mirror (large)	MJ-MC-G2	1
" I-13	Mirror (small)	MJ-MC-G3	1
" I-14	Illumination lens	MJ-MC-G4	1
" I-15	Mount fixing screw	MJ-BR-17	1
" I-16	Pan-head screw	Na 2604	5
" I-17	Sewscrew	Ng 2604	2
I-18	Sewscrew	Ng 2002	6
" I-19	Pan-head screw	Na 1704	4
" I-20	Setscrew	Ng 2003	3
" I-21	Mount	MJ-MA-1	1
" I-22	Joint ring	MJ-MA-2	1
" I-23	Lens frame	MJ-MA-3	1
" I-24	Screwed ring	MJ-MA-4	1
" I-25	Spacer ring A	MJ-MA-5	1
" I-26	Spacer ring B	MJ-MA-6	1
" I-27	Spacer ring C	MJ-MA-7	1
" I-28	Lens for 5X	MJ-5X-L1	1 set
" I-29	Lens for 5X	MJ-5X-L2, L3	1 set
" I-30	Lens for 5X	MJ-5X-L4, L5	1
" I-31	Lens for 5X	MJ-5X-L6	1
" I-32	Lens frame	MJ-MB-1	1
" I-33	Screwed ring	MJ-MB-2	1
" I-34	Spacer ring A	MJ-MB-3	1
" I-35	Spacer ring B	MJ-MB-4	1

* to be continued *

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-I-36	Lens for 10X	MJ-10X-L1, L2	1 set
" I-37	Lens for 10X	MJ-10X-L3, L4	1 set
" I-38	Lens for 10X	MJ-10X-L7, L8	1 set
" I-39	Screw for graduated plate		2
" I-40	Graduated plate	MJ-MA-8	1
" I-41	Open-shut plate	MPX-BO-137	1
" I-42	Shutter	COPAL No. 0	1

WIRING DIAGRAM FOR UNIMET



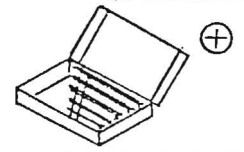
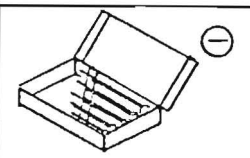
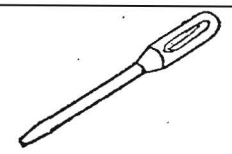
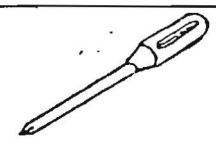
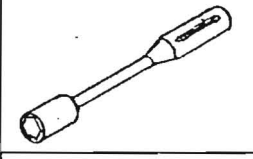
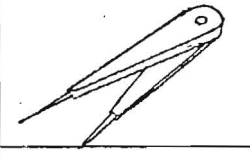
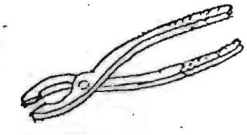
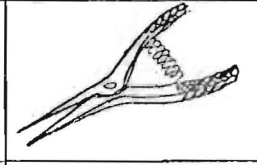
COLORING CLASSIFICATION OF WIRE

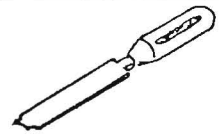
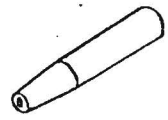
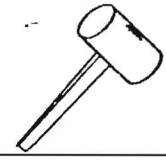
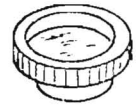
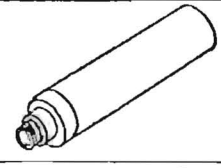
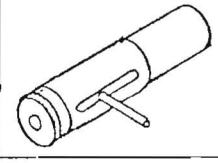
WIRE COLOR	MARK
Green	G
Light Green	L.G
Yellow	Y
White	W
Red	R
Brown	BR
Black	BL
Orange	O
Blue	B

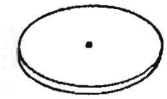
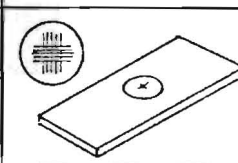
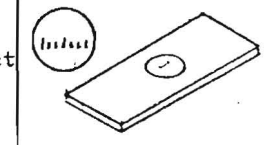
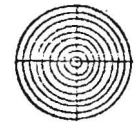
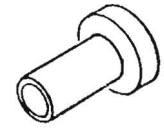
UNIMET-J, ELECTRIC PARTS SECTION

Code No.	Part Name	Drawing No.	Q'ty
UNIMET-J-1	H.L. mount	MJ-BR-7	1
" J-2	A.C. Connector	16-R3M	1
" J-3	Dimmer control	PC-103VUM(203VUM)	1 set
" J-4	Fuse holder	FH, FUSE 3A(2A)	1
" J-5	Transformer	ET-1501-26(1502-26)	1
" J-6	Volt meter	TS-42b	1
" J-7	Switch	SL260ND	1
" J-8	Connector for Transmitted light	RM12BR-3S	1

ASSEBLE TOOLS LIST

Tool No.	Tool Name & Dimension	Shape
T-1-1	plus face Setscrew Drivers	
T-1-2	Minus face Setscrew Drivers	
T-1-4 T-1-6 T-1-8	Minus face Drivers 6.2mm, 5.0mm, 3.0mm	
T-1-3 T-1-5 T-1-7	Plus face Drivers 6.2mm, 5.0mm, 3.0mm	
T-1-33	Hexagonal Nut Driver 7.0mm, 6.0mm, 4.0mm	
T-1-28	Tweezer	
T-1-25	Dividen 125mm	
T-1-16	Plier	
T-1-34	Plier for C ring	
T-1-24	Hexagonal Wrenches 1.5mm, 4.0mm, 5.0mm	

Tool No.	Tool Name & Dimension	Shape
T-1-13	Revolver Wrench A	
T-1-35	Minus Face Punch	
T-1-36	Knock Punch $\phi 2$, $\phi 3$	
T-1-26	Metal Hammer	
T-1-27	Wooden Hammer	
T-2-22	72mm Mirror	
T-2-30	Inspection mirror for Revolver	
T-2-31	Collimator	
T-2-32	Centering adjustment monocular tube for iris diaphragm	
T-2-6	Centering telescope 15X with concentric circles reticle (200m type)	

Tool No.	Tool Name & Dimension	Shape
T-2-23	Pin hole Gauge for Stage centering adjustment	
T-2-15	Section stage Micrometer for reflect light use	
T-2-17	1/100mm Stage Micrometer for reflect light use	
T-2-14A	Eyepiece	
T-2-28	Concentric Circle Reticle 18mm	
T-2-33	Centering & Parfocal adjustment tool for 35mm Photography 69 length	

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