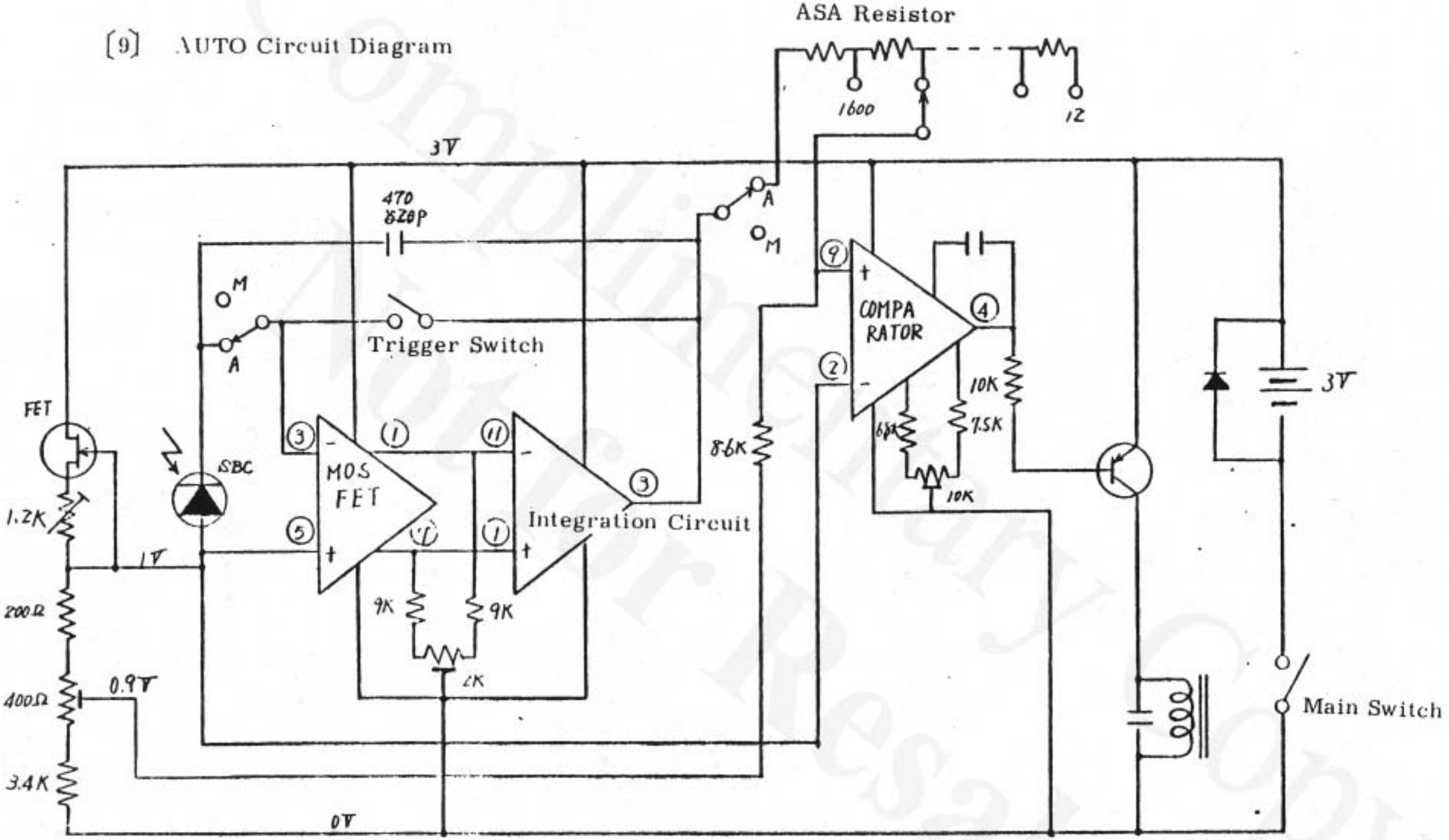
## [9] AUTO Circuit Diagram



〔10〕 Operation Sequence at AUTO

1) Wind lever is advanced.

Trigger switch is turned ON.

2) Shutter is released and mirror is flipped up.

Main switch is turned on. MG is turned on and closing claw A is fixed (closing curtain is fixed).

3) Opening curtain runs.

(a) Trigger SW is turned off. and condenser for AUTO (470pF) starts charging.

(b) The voltage applied to ASA resistor is increased, and the current to flow through the resistor of 8.6KΩ is increased.

(c) The voltages applied to pins 2 and 9 of IC 024 become same level. (pin 9 becomes 1V)

(d) The voltage on pin 4 of IC 024 is increased from 0V to 3V. (comparator)

(e) The transistor ceases to flow current, and MG is turned off.

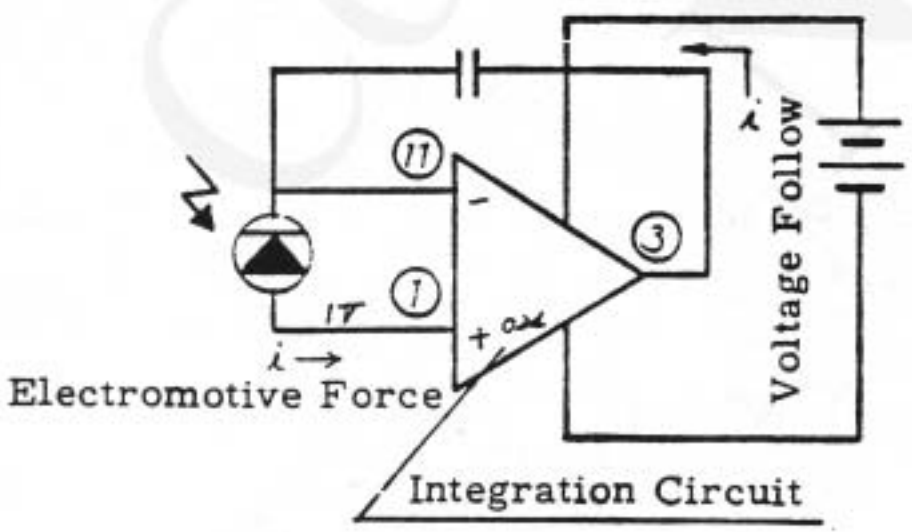
4) Closing claw is disengaged. and closing curtain runs.

5) Mirror flips down.

Main SW is turned off.

〔11〕 Supplementary Description of AUTO Circuit

1) Voltage Follow of Integration Circuit



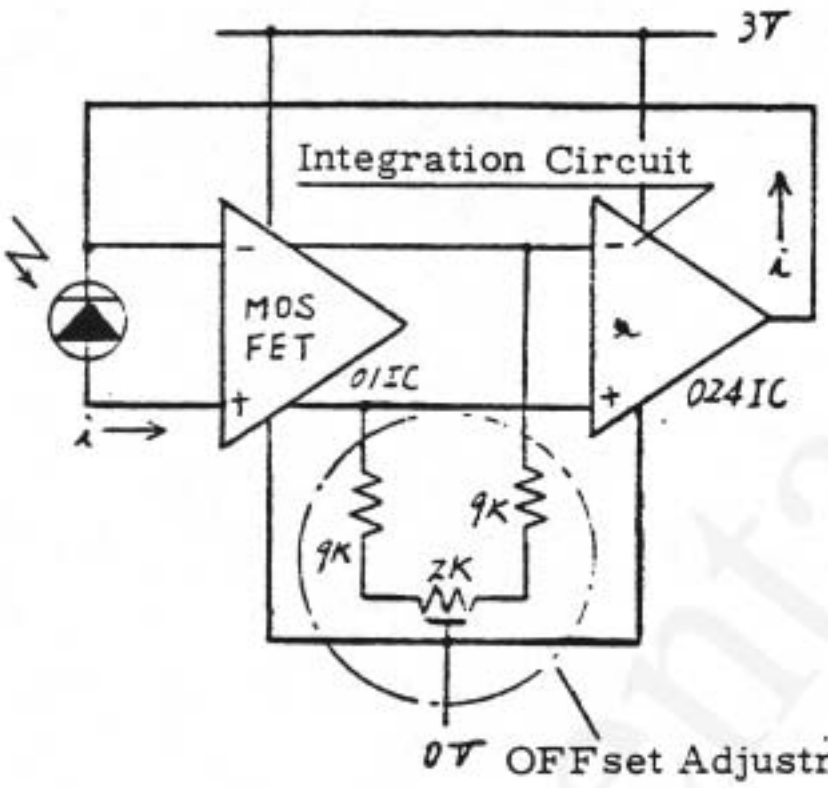

(a) When the SBC receives light. it permits electric current i to flow in the arrow direction because of its photo-electromotive property. (The current to flow is proportional to the amount of incident light.)

(b) The potential on the (+) side pin 1 of the integration circuit increases.

(c) The integration circuit has a property to draw current from the

circuit until potentials on the (+) and (-) pins become the same level (1V) to bring balance between (+) and (-). (This is called "voltage follow".)

2) Off Set Adjustment

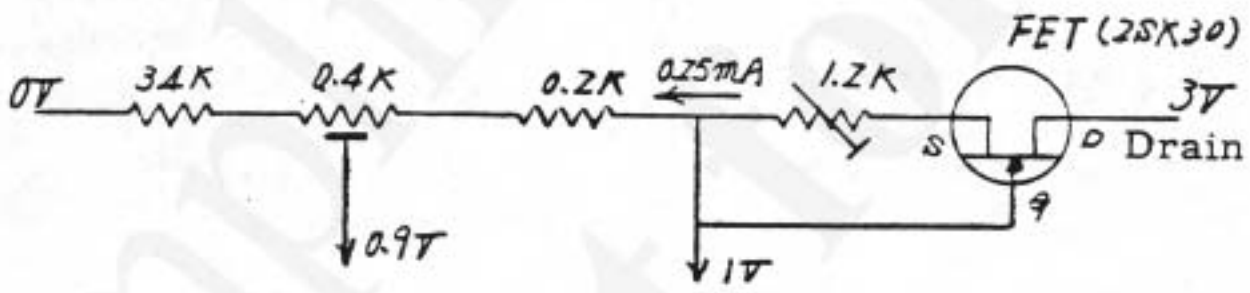



(a) Theoretically. same potential of 1V is to be applied to both (+) and (-) of IC 01. but this is not the case in actuality due to the inevitable variations in the properties of M circuit board, IC. etc. Thus. like in the circuit encircled. a variable resistor of 2KΩ is used to make the potential on both sides 1V.

(b) The 2KΩ variable resistor can adjust the range of about ±25mV.

(c) Improper OFF adjustment causes considerable affection to EE accuracy on the high ASA level.

3) Description of 1V and 0.9V Lines




(a) If the voltage between source (S) and gate (G) of FET is changed by means of the 1.2KΩ variable resistor. the current from S can be varied. The resultant current is constant even when the battery voltage 3V is changed. owing to the FET property. (The current is adjusted to 0.25mA.)

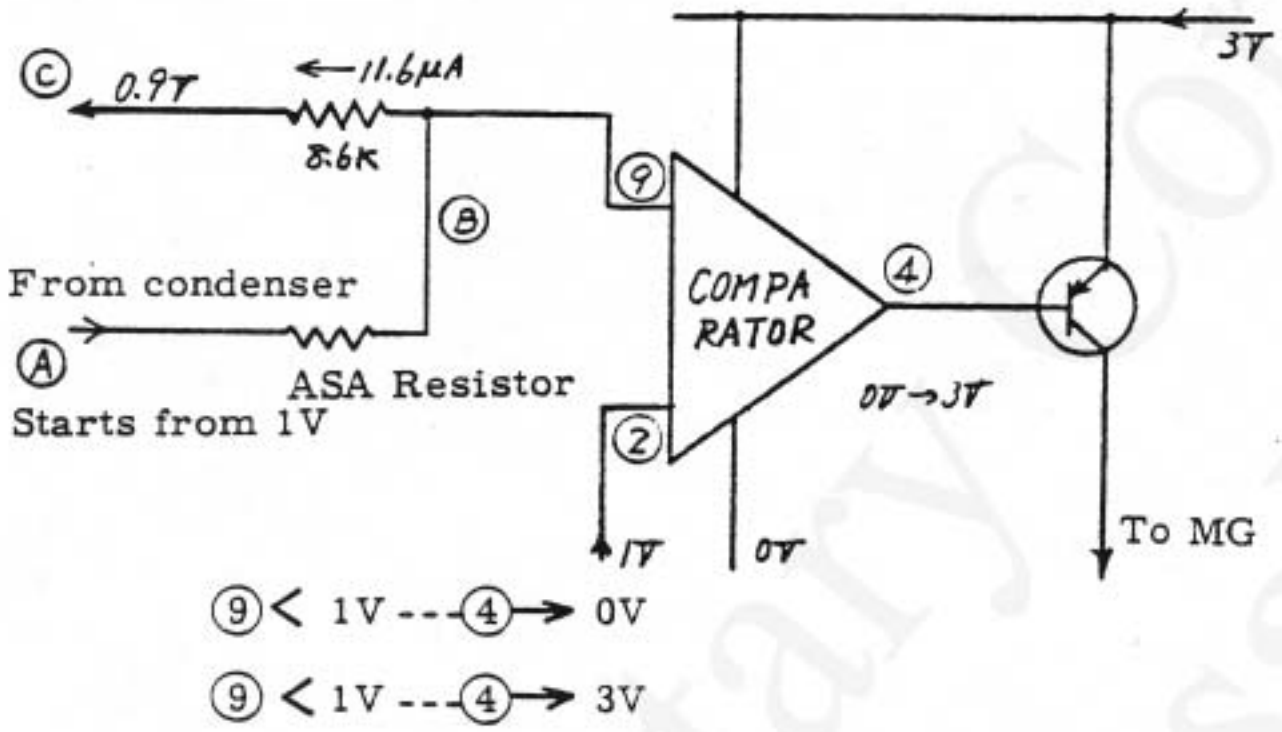
(b) 1V

(3.4KΩ + 0.4KΩ + 0.2KΩ) x 0.25mA = 1V

(c) 0.9V

(3.4KΩ + 0.4KΩ / 2) x 0.25mA = 0.9V

4) Comparator (Decision Circuit)




(a) The comparator is connected as illustrated above. When the condenser is charged and its voltage is increased, voltages at B and 9 are also increased.

Before charging A = 1V, so that 0.9V < B < 1V, and current flows in A → B → C .

(b) As charging of condenser advances (the voltage at A increases), the voltage at B is increased to greater than 1V (⑨>②). The condenser charging voltage at this time is calculated as described below.

The 1V at B lowers to 0.9V after passing through the resistor of 8.6KΩ . so the value of current flowing there through is:

$$\frac{1V - 0.9V}{8.6K\Omega} = 11.6\mu A$$

To flow the current of 11.6uA across ASA resistor (7.16KΩ at ASA 100) the increase in the voltage at A should be:

$$11.6uA \times 7.16K\Omega = 83mV$$

(condenser voltage becomes 1V + 83mV = 1.083V.)
The increment of 83mV is the charging voltage.
The charging voltage is also called "decision level" and is a very important value. See Section (13).

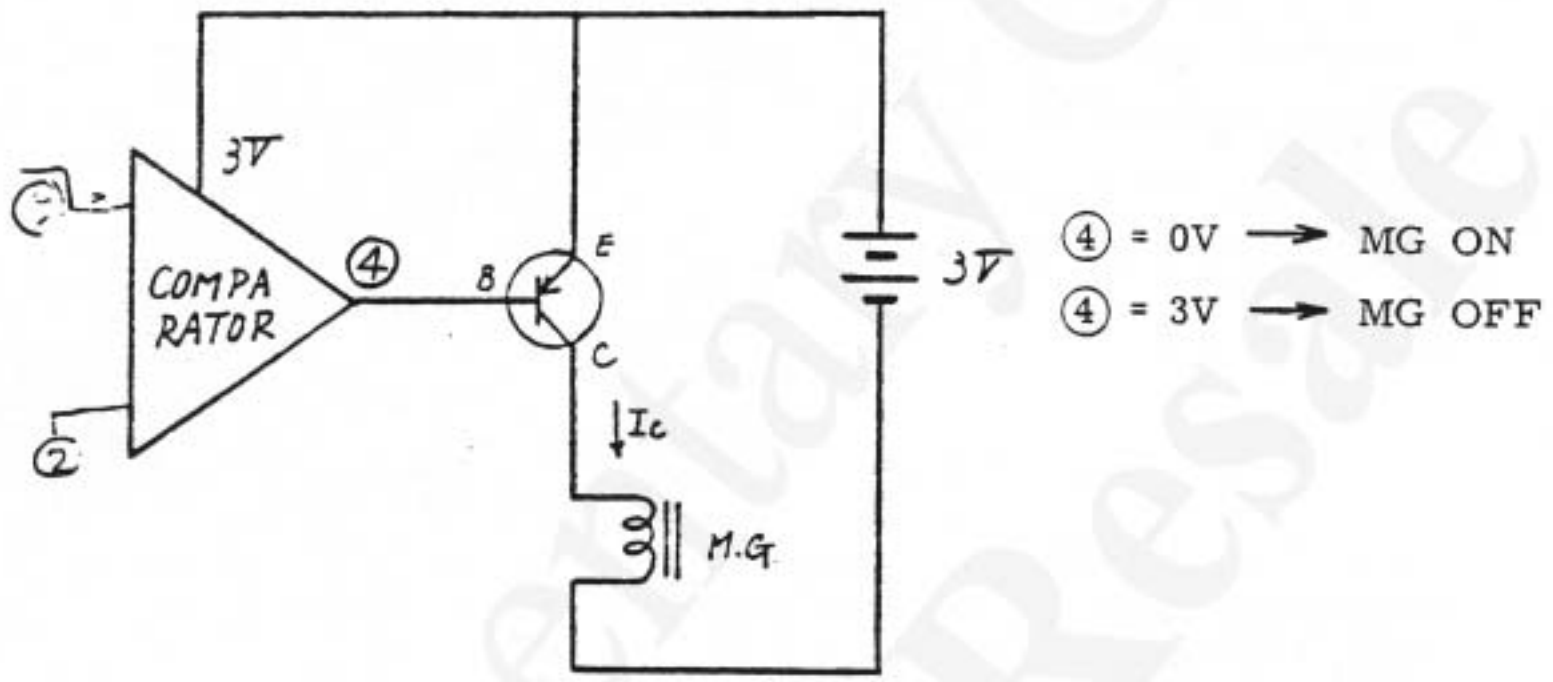
Note: Current flowing from B to 9 .
Since the impedance of the comparator is very high. the current across B - 9 can be considered zero and the above relation is established.

(c) When the voltage at 9 of the comparator becomes greater than that at 2 , the output will be switched as follow.

⑨<② (=1V): Pin 4 on the output side has 0V ..... MG ON

⑨<② (=1V): Pin 4 " has 3V ..... MG OFF

5) ON and OFF of Magnet



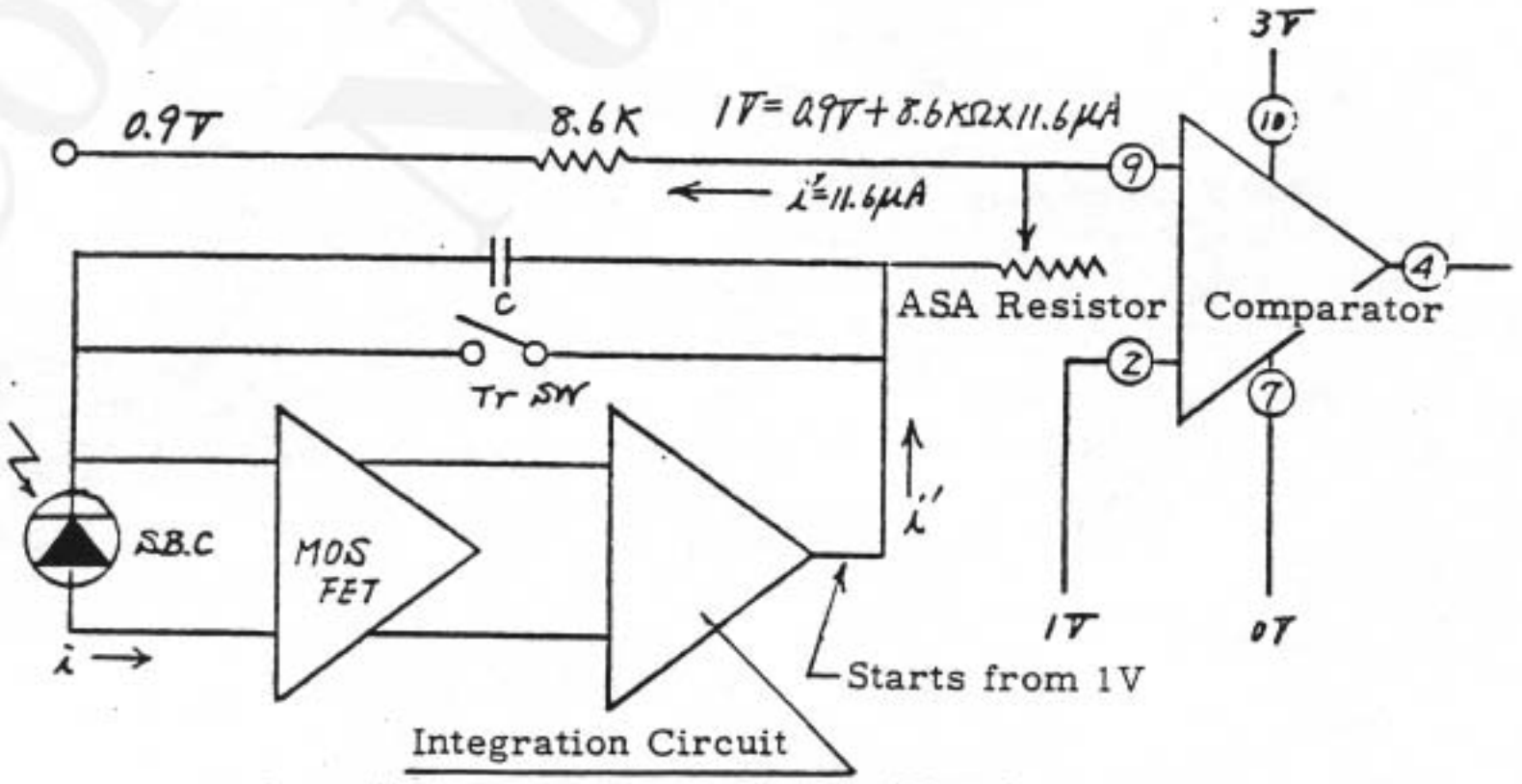

(a) MG ON

When pin 4 of comparator has 0V, the potential difference of 3V is generated between the base and emitter and current flows; hence, amplified current Ic flows into MG and MG is turned on.

(b) MG OFF

When pin 4 has 3V. there is no potential difference between B and E and no current flows; hence, no Ic current flows and MG is turned off..

[12] Operation Sequence of M Circuit Board at AUTO



1) Main SW is turned on, and Tr SW (trigger switch) is turned off.

2) When SBC receives light and electromotive force i is generated, current i' flows from the integration circuit of IC 024 through the MOS FET, and current is charged in condenser (i = i').

3) The voltage of the condenser is increased in proportion to the quantity of the charging current.

4) When the voltage of the condenser is increased to 1.083V, the current, obtained by the formula (1), flows in the ASA resistors of 7.16KΩ (at ASA 100) and 8.6KΩ .

$$i'' = \frac{1.083V - 0.9V}{7.16K\Omega + 8.6K\Omega} = 11.6\mu A \quad \ldots\ldots\ldots\ldots\ldots (1)$$

5) The voltage at pin 9 is:

$$V_{⑨} = 0.9V + 8.6K\Omega \times 11.6uA = 1V \quad \ldots\ldots\ldots\ldots (2)$$

6) According to the property of comparator, when the voltage at pin 9 becomes greater than that at pin 2 (⑨>②), the voltage at the output pin 4 is switched from 0 to 3V.

7) For the turning on and off of MG, see preceding page.

8) ASA conversion is done by changing ASA resistance. thereby changing the charging voltage of the condenser which is necessary to flow the current of i'' = 11.6uA. (The charging time is changed, and thus the exposure time is changed.)

9) The shutter speed change corresponding to the change in the brightness of the subject or scene is done as follow.

When the light intensity received by the SBC changes. electromotive force i changes linearly ($\gamma = 1$) and the current i'' changes at the same time, and thus the charging time of the condenser is always properly controlled.

## [13] ASA Conversion and Decision Level

As the current of 11.6uA flows between the ASA resistor and the resistor of 8.6KΩ . the potential of 0.1V is generated there between. See Sections [11] - 4) and [12].

This current flows from the charged condenser through the ASA resistor. If the value of 11.6μA is constant and the value of the ASA resistor is changed. the charging voltage can also be changed according to the Ohm's law.

$$I = \frac{E}{R} = 11.6\mu A \text{ (constant)}$$

Due to the integration circuit, the following relationship is established between the charging voltage and time (light quantity is constant).

$y = x$

y: charging voltage

x: charging time

When charging voltage is doubled, charging time is also doubled. This enables ASA conversion.

Charging voltage for each ASA value is obtained by the following formula:

As the charging voltage is 83mV for ASA 100

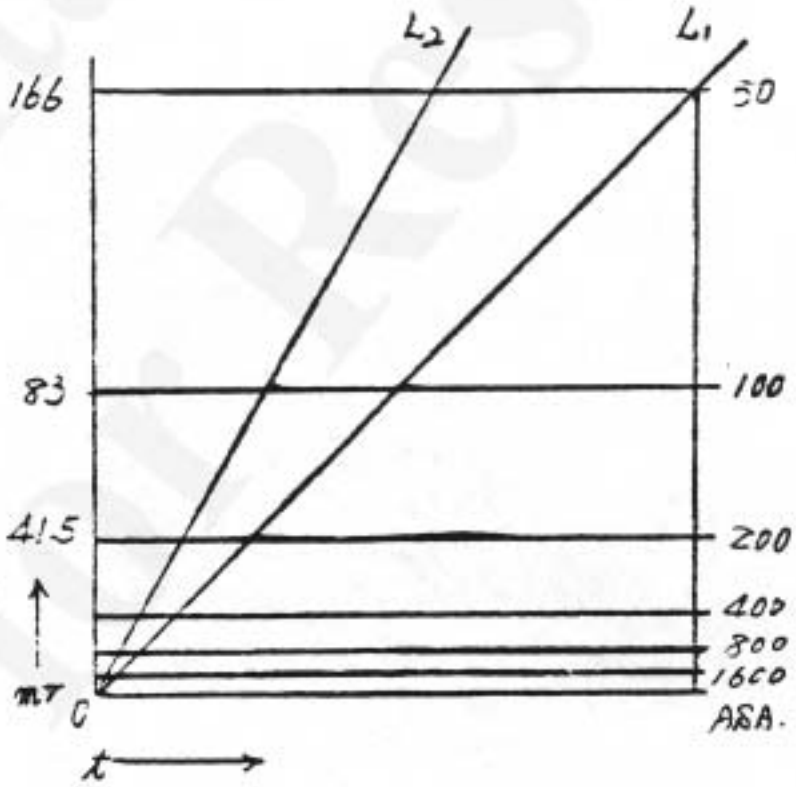
$$V = \frac{100}{ASA} \times 83mV$$

ASA: ASA sensitivity

"V" is called "decision level".

| ASA | Theo-retical Value (mV) | Correct-ed Value | Resist-ance Value (Kn) |
|---|---|---|---|
| 12 | 664 | | 57.2 |
| 25 | 332 | | 28.6 |
| 50 | 166 | | 14.3 |
| 100 | 83 | | 7.16 |
| 200 | 41.5 | | 3.58 |
| 400 | 20.8 | | 1.79 |
| 800 | 10.4 | 11.9 | 1.02 |
| 1600 | 5.2 | 7.4 | 0.64 |

Decision Level and Resistance




ASA and Decision Level

(Subject luminance $L_2 > L_1$. ASA relation is the same.)

14 Shutter Curtain and "Off" timing of MG

There is the following relation between the shutter curtain and MG.

If $T_1$ is made equal to $T_2$. $T_{MG}$ can be made equal to $T_s$

where:

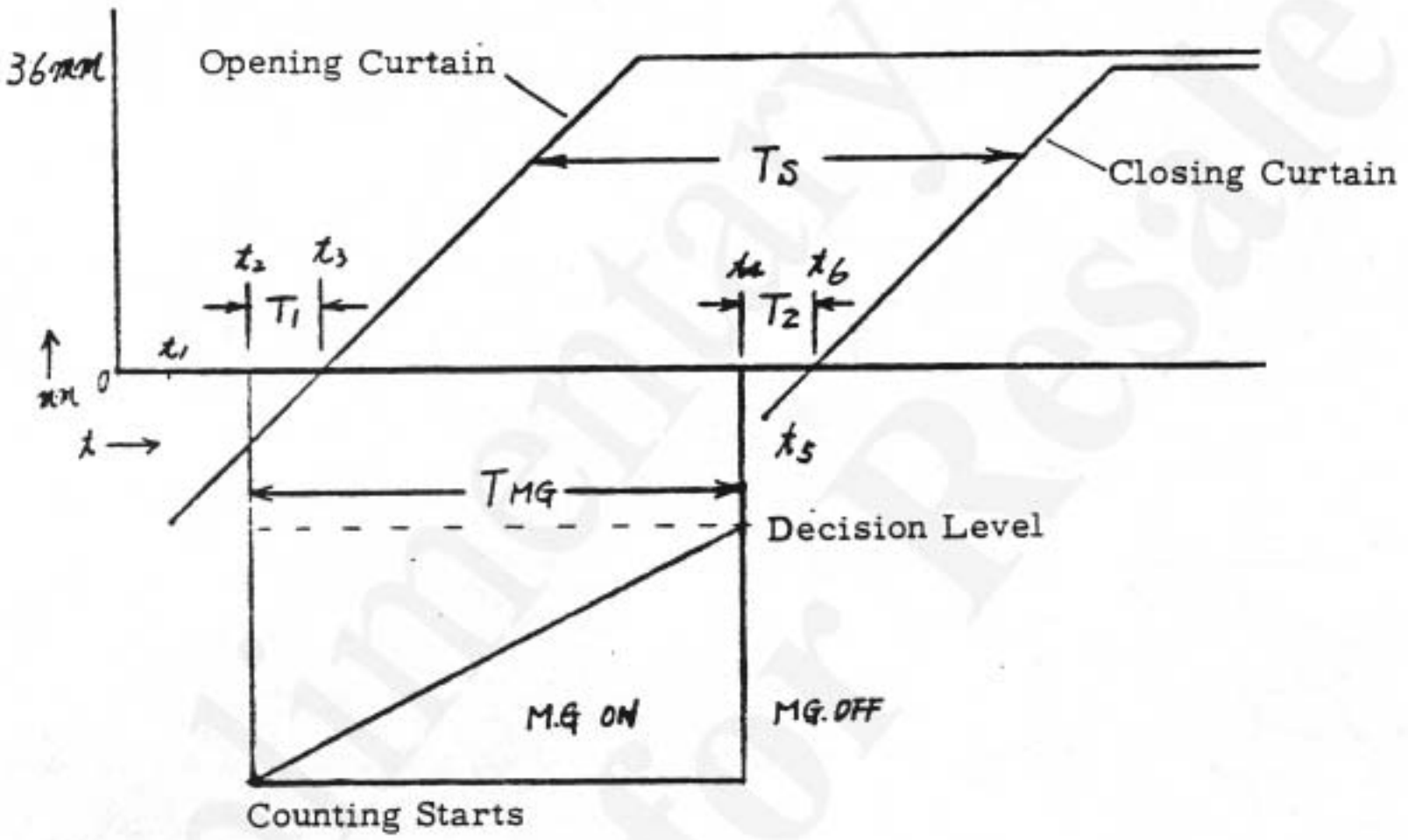
$T_s$ .... Shutter speed ($t_3 - t_6$)

$T_{MG}$ ... MG attractive time ($t_2 - t_4$)

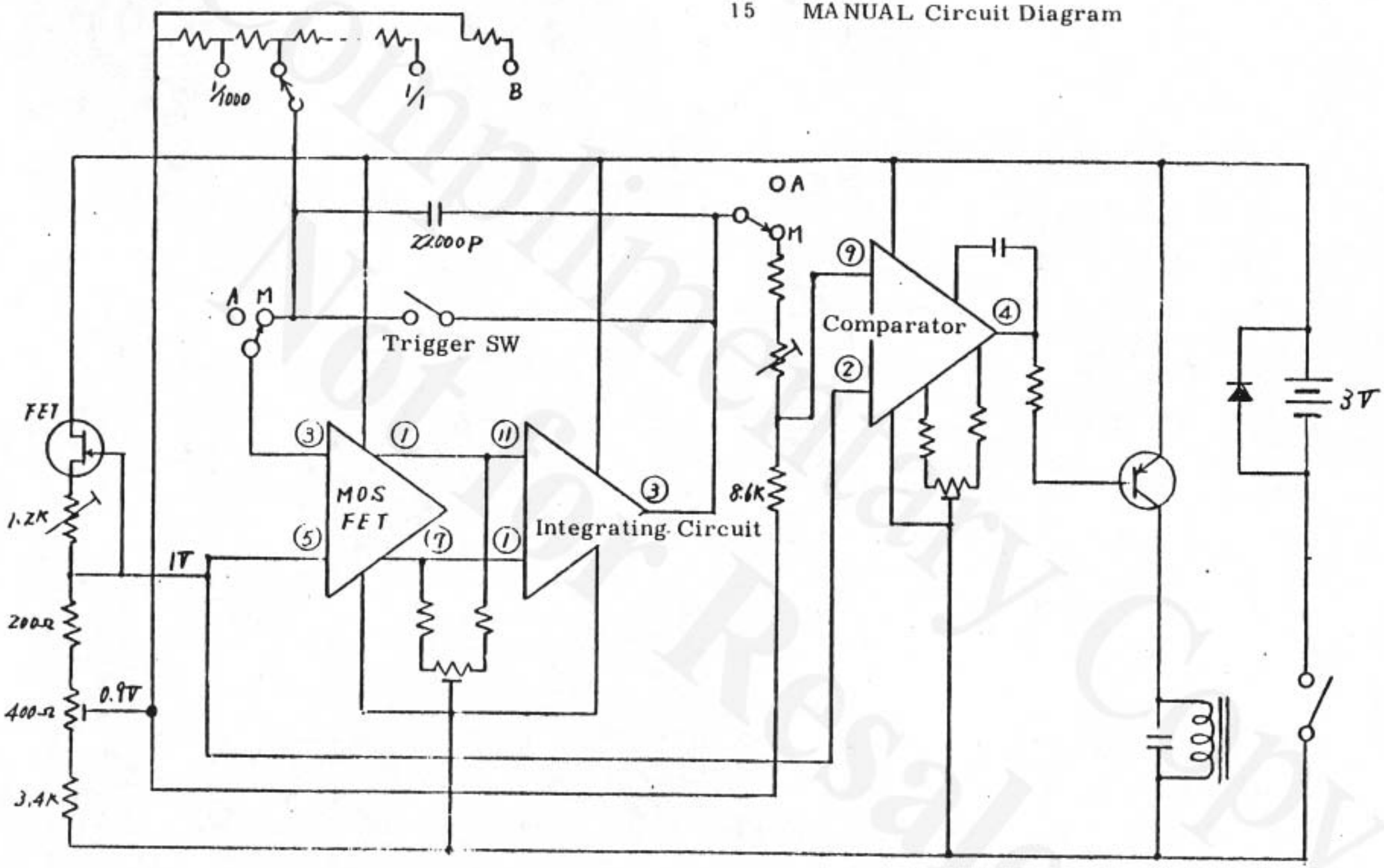
$T_1$ ..... Time required from the turning off of trigger switch to the start of exposing the screen ($t_2$ - $t_3$)

$T_2$ ..... Time required from the turning off of MG to the start of closing curtain ($t_4$ - $t_6$)

The adjustment of $T_1 = T_2$ is done by adjusting the timing of the trigger switch. The time $t_4$ - $t_5$ is a delay time due to the residual magnetism in the MG; etc.




$t_1$ ..... Opening curtain starts running.
$t_2$ ..... Trigger SW turns off.
$t_3$ ..... Exposure starts.
$t_4$ ..... MG turns off.
$t_5$ ..... Closing curtain starts running.
$t_6$ ..... Screen starts to be closed.



〔16〕 Operation Sequence at MANUAL

The operation of M circuit board is the only difference from at AUTO. Other shutter mechanisms operate in the same manner as at AUTO.

At AUTO:

(1) SBC converts the intensity of light to electrical quantity, and controls shutter speed.

(2) The condenser charging voltage is led into the comparator through the ASA resistor.

At MANUAL:

(1) SBC and ASA resistor are disconnected from the circuit.

(2) The shutter speed circuit board is connected to one pin of the MOS FET. The shutter speed is controlled by changing the current value, which is obtained by varing fixed resistance of shutter speed circuit board.

The operation sequence is as follow:

(1) Pin ⑤ of MOS FET is applied with 1V.
Pin ③ of MOS FET is connected to 0.9V through the shutter speed circuit board.

(2) Since there is a potential difference between the input pins of MOS FET, when the trigger switch is turned off. voltage follow is effected by the integration circuit.

(3) The condenser for MANUAL is charged and voltage of condenser is increased.

(4) When the voltage at pin ⑨ from integration circuit becomes 1V or greater. the comparator activates. and the voltage on pin ④ of comparator is switched from 0 to 3V. MG is then turned off.

(5) Closing curtain runs.

〔17〕 Shutter Speed Circuit Board

The shutter speed circuit board is directly connected to the speed gear. When the shutter dial is turned. the circuit board rotates to set a resistance value corresponding to each shutter speed. The resistors for individual shutter speeds are serially connected. The shutter speed of 1/1000 sec. is set to the minimum resistance value.

〔18〕 Outline of Exposure Meter

As described in the preceding section, the exposure meter provides only the viewfinder information, and is separated from the automatic operation of the shutter.

Following points are the major differences as compared with OM-1.

(1) For coupling of aperture ring and exposure meter, the conventional cam is replaced by a cord for directly connecting each other.

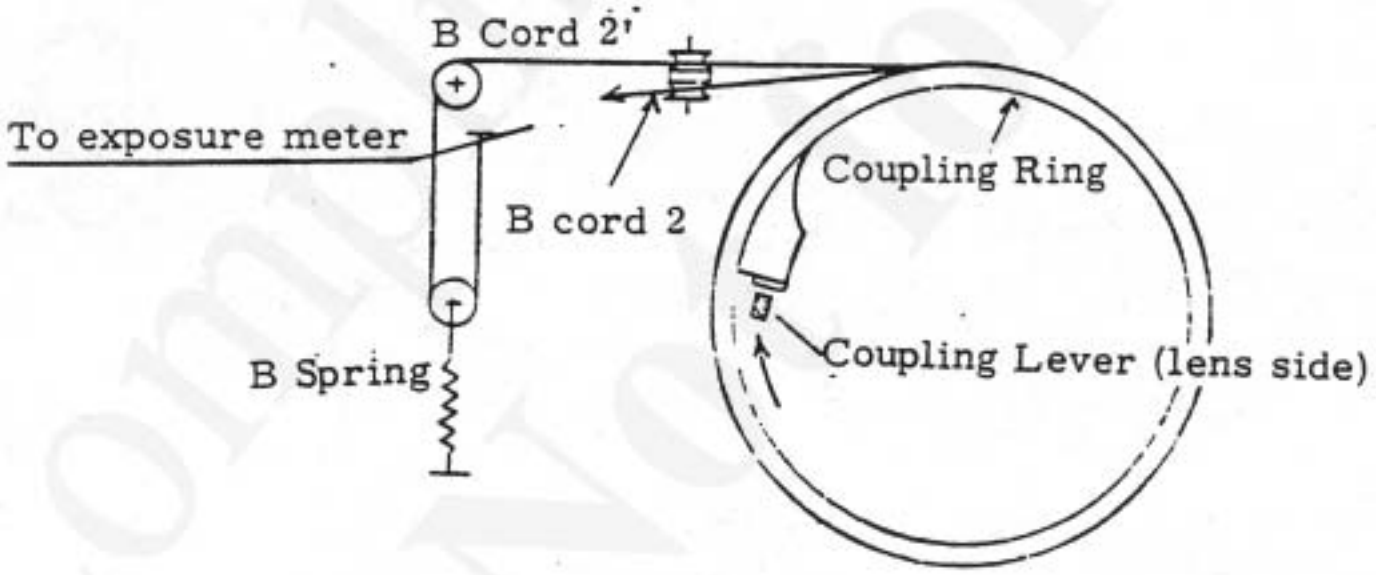
(2) Coupling of shutter dial and exposure meter has been changed from mechanical one to electrical resistor switching.

(3) Information display within viewfinder is different for AUTO and OFF.

〔19〕 Coupling Mechanism of Aperture Ring and Exposure Meter

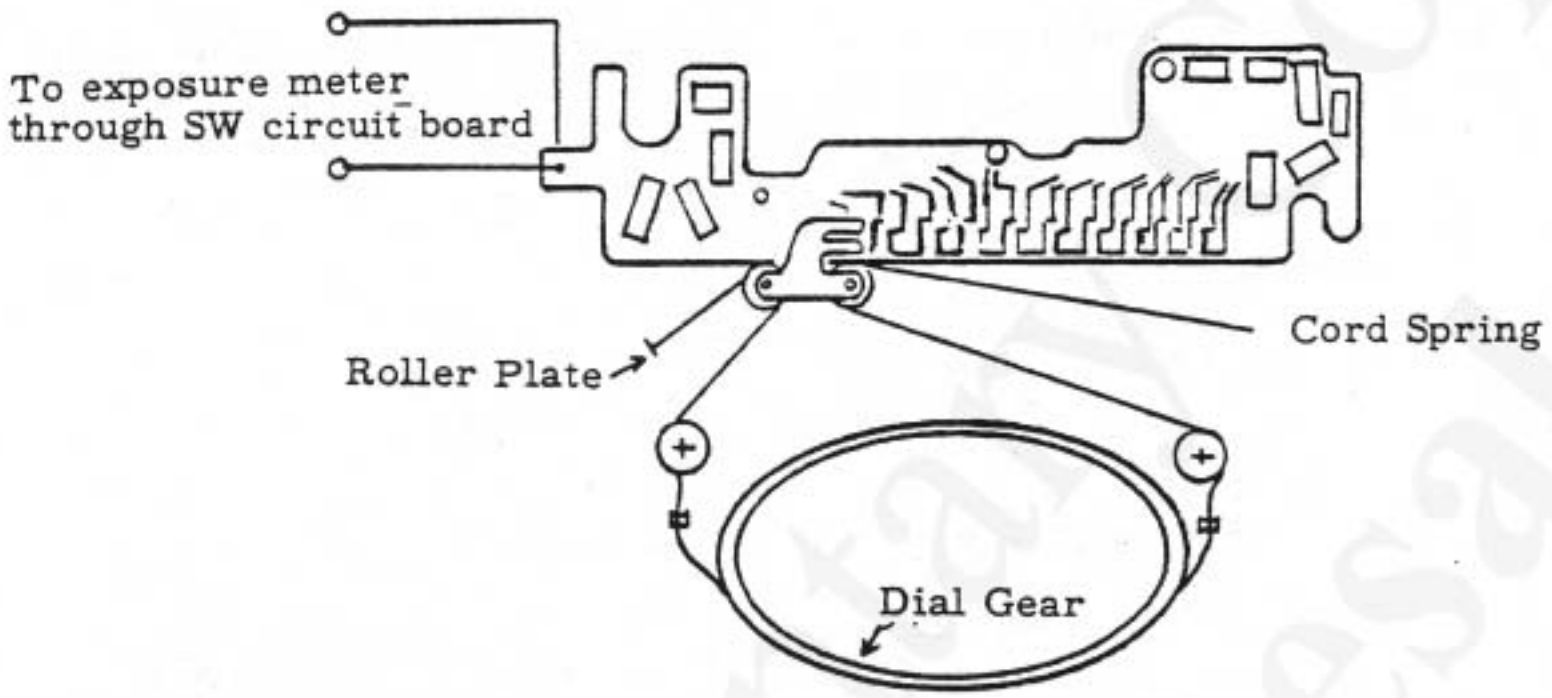
When aperture ring is turned, coupling lever (lens side) rotates the coupling ring. The rotation of the coupling ring winds the B cord 2 and turns the meter pulley.

At this point, B cord 2' adhered to the outer periphery of the coupling ring is simultaneously moved to pull on B spring. The projection of the coupling ring is assured of follow ability in that it is always brought to bear on the coupling lever of the lens, whenever the aperture ring is turned back.




〔20〕 Coupling Mechanism of Shutter Dial and Exposure Meter

When shutter dial is turned, the directly connected dial gear rotates, the cord (B cord 1) adhered to the outer periphery of dial gear moves SL contact piece to change the resistance of B circuit board and meter deflection is changed.




〔21〕 ASA Conversion

(1) At AUTO, ASA conversion is made through resistors of AR circuit board glued to A cam.

(2) At MANUAL, ASA conversion is made by operating P lever by means of A lever 1 to deflect the exposure meter. (A-lever 1 makes one body with A-lever 2 which is brought to bear on A-cam.)

〔22〕 F/stop Conversion

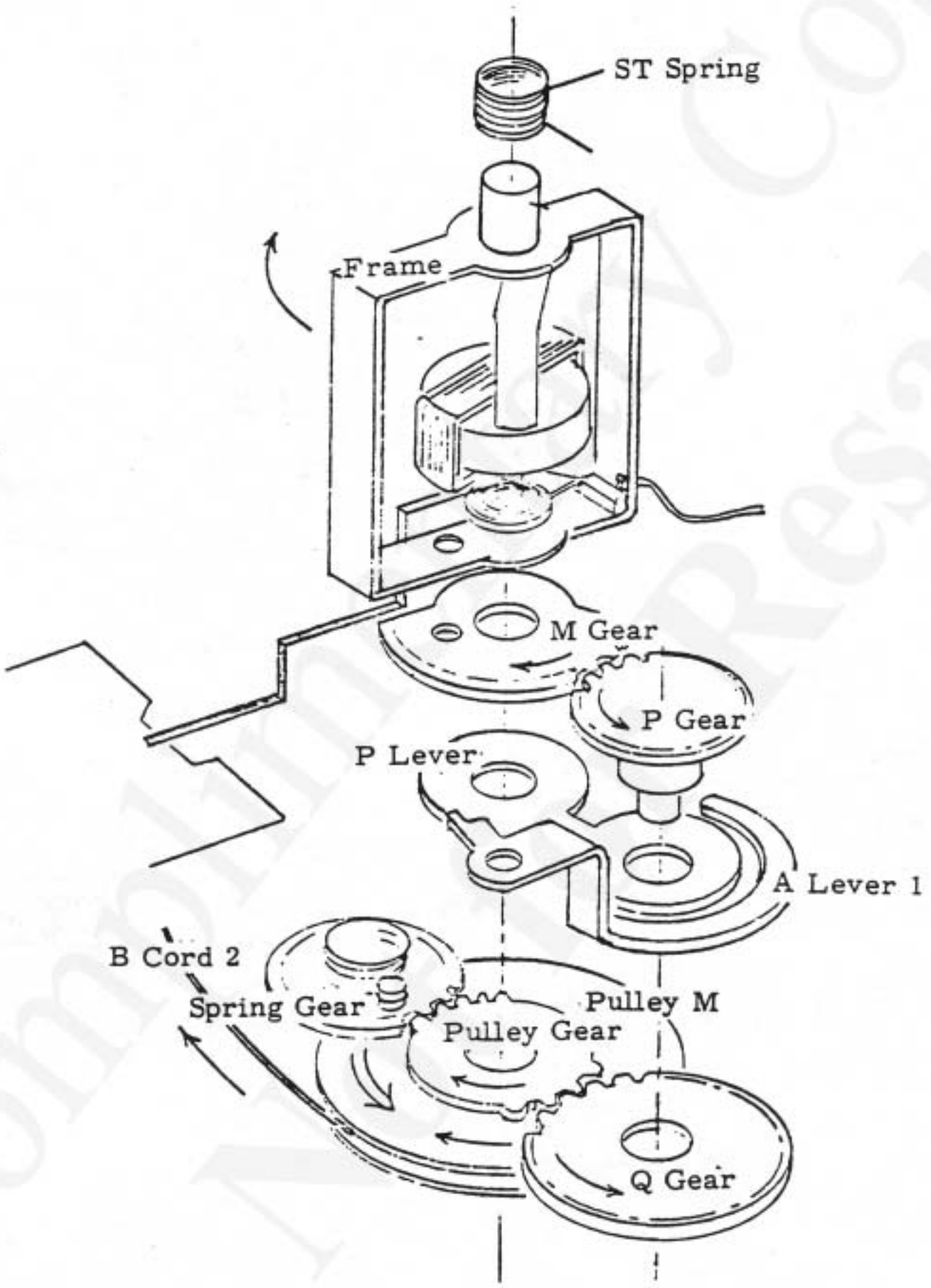
When aperture ring is turned from F16 to the maximum lens opening, the cord (B cord 1) moves in the arrow direction to rotate pulley M.

The pulley gear, which is made in one body with pulley M, rotates Q gear and turns M gear through P gear, which is made in one body with Q gear. The M gear is fixed via screw to meter frame and rotates the meter.

The pulley M is always tensioned in the arrow direction (⇒) by means of a spring, hooked to the spring gear, and ST spring. The cord (B cord 1) is always tensioned.

See next page.

Mechanism of Meter's Movable Parts




B cord 2 is interlocking with coupling ring

OLYMPUS
OM-2

# CHECK POINTS (INSPECTION STANDARDS)

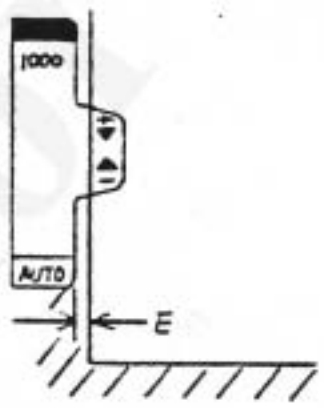
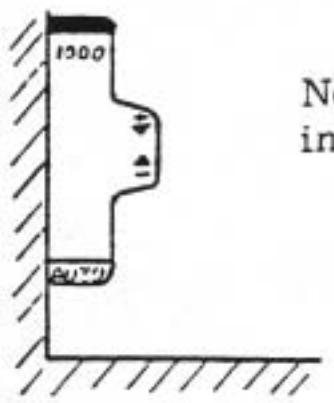
# CHECK POINTS (INSPECTION STANDARDS)

## CONTENTS

Page

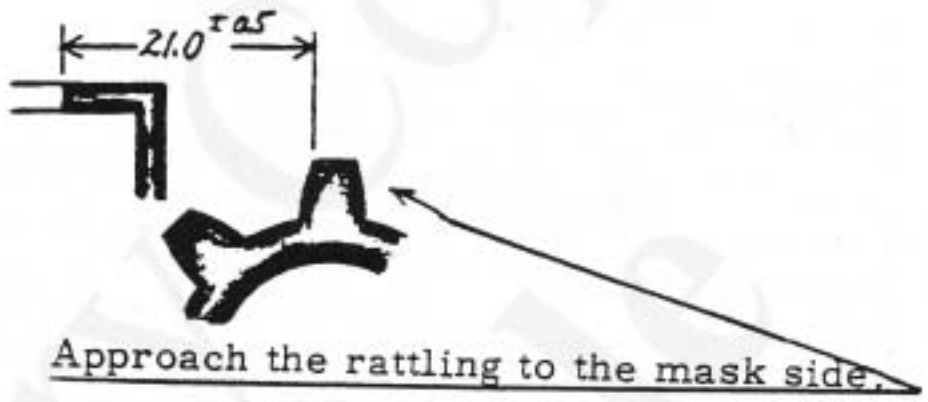
II. Functions and Features (Items to be checked by measuring instruments)

I. Appearance and General Functions

| Major Check Point | Relative Functions to be checked | Checking Method or Points of Special Attention |
|---|---|---|
| 1 View-finder | 1) Viewfield | (1) No dirt or filth on it.<br>(2) No image cut-off due to foreign substance.<br>(3) The edge of the prism should not be observed conspicuously.<br>(4) Viewfield Percentage: $97^{+1}_{-2}$% (with MS5018) |
| | 2) Focus | (1) When focused at ∞ or at a distance desired. there should be no discrepancy between the reading on the focusing ring and the actual distance from subject to the film surface. |
| | 3) Eyepiece Frame | (1) No deformation, rattling. nor space between the top cover. The magnifier should be mounted onto it firmly. |
| 2 Exposure Meter | 1) Position of the indication plate | (1) In case of MANUAL<br>  <br><br>$E \geq 0$ |
| | | (2) In case of AUTO<br>  <br><br>No excessive inclination |
| | 2) Scratch and dirt of the indication plate | (1) Should not be observed conspicously. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Exposure Meter | 3) Assurance of coming in and out of the indication plate | (1) Should be surely interlocked with the operation of the selector lever. |
| | 4) Smoothness of coming in and out of the indication plate | (1) Should not be unsmooth or with no friction against the meter needle. |
| | 5) Play of the meter needle | (1) None |
| | 6) Stuck of the meter needle | (1) Should not be stuck when deflecting to the middle of 1/2 - 1/4 (temporal). |
| | 7) Length of the meter needle | (1) In case of AUTO. at the longer, should be lower than the dotted line.<br>  |
| | | (2) In case of AUTO. at the shorter, should be over the dotted line.<br>  |
| | 8) Deflection range of the meter needle | (1) Red zone<br>  The needle should be within the red zone in its full width. |
| | | (2) Blue zone<br>  The needle should be within the range shown in the illustration. |

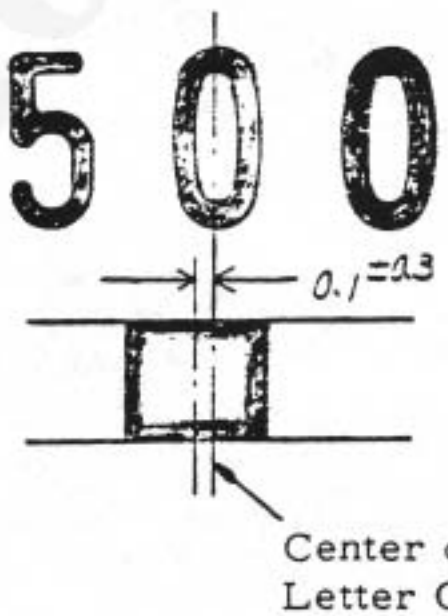
| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| 3 R Knob | 1) Rattling of the knob | (1) No rattling vertically.<br>(2) Horizontal tolerance should be 0.1mm or less in the stored position.<br>(3) Should be 0.3mm or less at the tip of the knob when pulled out. |
| | 2) Operation of the knob | (1) Smooth and accurate rotation for rewinding with no excessive uneveness and squeak regardless of whether the film is loaded.<br>(2) Surely pulled out (second step) and automatically returned to the original position. |
| | 3) R knob pulling force | First step: 350 ±100g<br>Second step: 1200 ±300g |
| 4 Rear Cover | 1) Horizontal rattling of the rear cover | (1) No rattling at the lock portion when locked regardless of whether there is patrone. |
| | 2) Rattling of the hinge | (1) Slight up-down movement<br>No friction on the end surfaces of the upper and lower plates.<br>(2) Vertical tolerance<br>0.15 or less |
| | 3) Assurance of opening and closing | (1) Smooth with no friction to the upper and lower plates. |
| | 4) Demounting pin | (1) Should be depressed with no excessive unsmoothness and squeak.<br>(2) Should be surely returned when released after the depression.<br>(3) Pin Operating Force<br>350 ±80g |
| 5 Pressure Plate | 1) Mounting position | (1) Should be mounted with the fixed side come to the lock side. |
| | 2) Flatness | (1) Should be 0 - -0.03. but the (-) should be concave against the lens. |

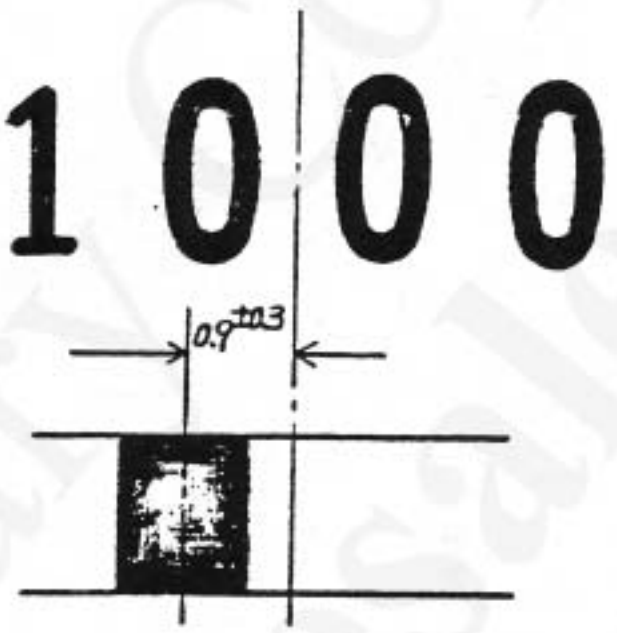
| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| 6 Sprocket | 1) Position of the teeth |   Approach the rattling to the mask side. |
| 7 Spool | 1) Rattling | (1) Vertical tolerance 0.3 or less (temporal) |
| | | (2) Radial tolerance 0.25 or less (at the outer spool diameter) |
| | | (3) Rotational direction 3 or less |
| | 2) Operating force | (1) 180 - 350g x 6mm 180 - 400g x 6mm. temporal |
| 8 Shutter Curtain | 1) Appearance of Edge Metal | (1) Prior or subsequent to film advancement, the edge metal should not appear within the mask. |
| | 2) Uneveness. blurring. unclearness and moire of the curtain | (1) Opening curtain should have no conspicuous uneveness. blurring. unclearness and moire. |
| | 3) Position of the curtain | (1) Opening curtain should have no excessive inclination in the pattern. |
| | | (2) Opening curtain should have no excessive vertical deviation. |
| | 4) Assurance of the curtain tension | (1) The curtains should not be slanted nor loose. |
| 9 Film Advance Lever | 1) Rattling | (1) Vertical tolerance (at the center of the axis): 0.2 or less |
| | | (2) Tolerance at the tip of the lever: 0.35 or less, temporal 0.7 or less |
| | | (3) Horizontal and vertical tolerance (at the center of the axis): 0.1 or less |

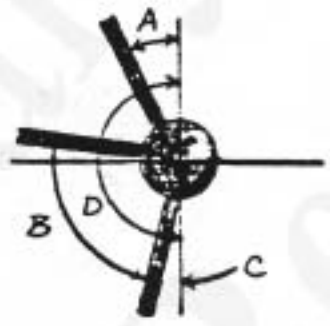
| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Film Advance Lever | 2) Assurance of operation | (1) Upon a full stroke or winding motion, film should be advanced by a full frame and the shutter and the mirror should be charged accurately.<br>(2) Even with a quick winding, the shutter should be set accurately. |
| | 3) Smoothness of operation | (1) Film should be advanced smoothly without difficulty at the start of the lever motion, an extreme friction, uneven movement, or squeaks. |
| | 4) Operating force | (1) Should be 1000g or less at the tip of the lever, when film is loaded. |
| | 5) Assurance of the film advance by short strokes | (1) Even with short strokes, the film should be advanced properly and locked in position accurately. |
| | 6) Assurance of the prevention for double film-advance | (1) Film cannot be advanced consecutively for the second frame without shutter release. |
| | 7) Assurance of the film release | (1) Upon shutter release. the film can be advanced for the subsequent frame. |
| | 8) Shutter release prior to or during the film advancing motion | (1) It should not allow the shutter release action prior to or during the film advancing motion. Be cautions at the point immediately prior to completion of the film advancing motion, particularly. |
| | 9) Pre-advancing force of the film winding lever | (1) Should be 25 - 50g at the tip of the lever. |
| 10 Release Button | 1) Rattling | (1) Vertical: No rattling<br>(2) Slight up-down motion: 0.25 or less |
| | 2) Assurance of operation | (1) Surely released.<br>(2) Surely returned to the original position even when released slowly after depressed strongly. |

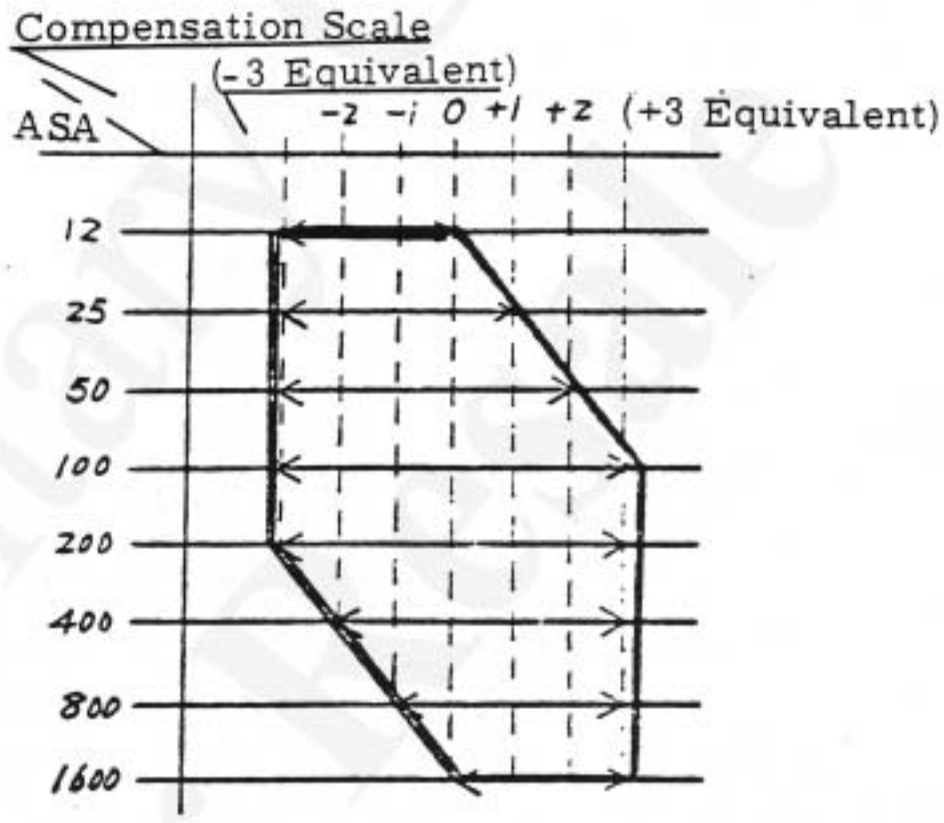
| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Release Button | 3) Smoothness of operation | (1) Should be smooth with no friction, uneven movement and squeaks. |
| | 4) Rotation of the release button | (1) No rotation. |
| | 5) Release force | (1) 240 ± 50g<br>See the Product Standards. |
| | 6) Button free height | (1) +1.3 ± 0.2 (from the tip of the button base) (The plus sign (+) means that the button is extruding from the button base.) |
| | 7) Release position | (1) -0.2 ± 0.15 (from the tip of the button base) |
| 11 Film Counter | 1) Accordance of index and frame number | (1) In case of the letter for the start:<br>  <br>After opening and closing of the rear cover, the index lines should not be out of S. |
| | | (2) At "1" and even numbers:<br>  <br>Figure<br>Width 0.8<br>The center of the index line should be within ±0.4 from the center. |
| | 2) Indication of No. 1 | (1) Upon closure of the rear cover and completion of charging (or even without charging). the first figure ("1") should appear in the window after advancement of 3 frames. |
| | 3) Stop position | (1) When the number plate stops at (37). "E" should be, visible. |
| | 4) Assurance of returning | (1) When the rear cover is opened. the number should return accurately to the "S" position. |
| 12 Film Rewinding Clutch | 1) Inclination | (1) Should be ±2° or less against the vertical in the normal state. and $90^{+10^{\circ}}_{-0}$ in the set state.<br>The set position can be 85°, rarely. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Film Rewinding Clutch | 2) Space between the upper plate and the rewinding clutch base | (1) Between the upper plate: 0.2 or less |
| | | (2) Between the frame: 0.3 or less |
| | 3) Assurance of R side setting | (1) When turned 90° or beyond. it should be set accurately and should not return to the original position. (Setting can be performed even during the film-advancing motion.) |
| | 4) Assurance of operation | (1) When the knob is set. the sprocket should be released and made free in motion. |
| | 5) Smoothness of operation | (1) Should be surely returned to the original position in the early stage of the subsequent film-advance motion. |
| 13 S Lever (AUTO/ MANUAL Selector Lever) | 1) Rattling | (1) Vertical tolerance: 0.07 or less |
| | | (2) Slight up-down motion: 0.25 or less at the tip of the lever |
| | | (3) At the click time: No rattling |
| | 2) Assurance of operation | (1) Clicking should be felt. Even if it goes beyond MANUAL. it should return to the clicking position when releasing the finger. |
| | 3) Smoothness | (1) Smooth without extreme uneven movement and difficulty. |
| | 4) Assurance of action | (1) The lever must be clicked into place at the MANUAL. AUTO. and OFF Positions Securely. |
| | 5) Assurance of the interlocking of the indication plate | (1) The indications within the view-finder should surely be changed over in interlocking with the lever setting to the AUTO. MANUAL and OFF. respectively. |
| | 6) Check stop position | (1) 20° ± 5° |
| | 7) Assurance of returning from the check position | (1) Should be surely returned to the AUTO click position when releasing the finger. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| 14 Checker | 1) Temperature characteristic | (1) Within 100 mV/10° against the room temperature. |
| | 2) Brightness of lighting | (1) The lighting (red light) should be discriminated even in the circumstance equivalent to BV15.<br>The voltage is to be 2.65V. |
| | 3) Limitation of lighting | (1) LED should surely light up when the S lever is set to the CHECK position with batteries of at least 2.75V loaded. |
| 15 Shutter Dial | 1) Marking | (1) B: Fluorescent red<br>1 - 60: Purple blue<br>125 - 1000: Black |
| | 2) Rattling | (1) Horizontal: 0.15 or less |
| | | (2) Click: 0.2 or less at the outer shutter dial diameter |
| | | (3) Radial: 0.1 or less |
| | 3) Accordance of graduation | (1) Discrepancy between the center of the index and that of the letter (B - 250) should be ±0.3 at the center of the carved letter.<br>(500)<br>  <br><br>Center of Carved Letter Group |

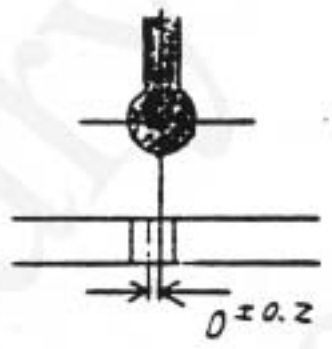
| Major Check Point | Relative Function to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Shutter Dial | | (1000)<br>  <br> |
| | 4) Change-over position | (1) Should be changed over at 2/3 ± 1/3. Should be surely changed over at the 1/125 click position. |
| | 5) Assurance of resetting | (1) Reset should be made surely. |
| | 6) Position of resetting | (1) Should not be reset even if the S dial is turned to the stop position on the B side. |
| | | (2) Reset should be made surely when the reset button is depressed to set to B. |
| 16 Self-timer | 1) Inclination of the lever | (1) Should be ±1° against the vertical in the state before setting. |
| | | (2) Parallelism to the rewinding clutch should be observed normal. |
| | 2) Smoothness of setting | (1) Setting should be made smoothly without no friction. extreme uneven movement and squeaks. |
| | 3) Smoothness of the lever returning | (1) Upon setting of the self-timer. the setting lever alone will return to its original position smoothly with proper friction but without staggering by self-weight. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Self-timer | 4) Assurance of stopping in the middle of run and restarting | (1) If the start-lever is pushed to the left during the timer operation, the timer should be stopped. But when the lever is returned to the correct position again, the timer should resume operation accurately. |
| | 5) Smoothness of operation | (1) The self-timer should operate smoothly without uneven movement such as hesitation or stoppage. |
| | 6) Operation angle of the lever |  <br>A: Unsettable range, not exceeding 40° (for reference)<br>B: Release button operable range, 70 - 190°<br>C: Slip range after setting, not exceeding 10°<br>D: Charge side stop position, 190° ± 3° |
| | 7) Operating time | (1) Full set: 12 ± 3 sec. |
| | | (2) Allowance after release: 5 sec. or less |
| 17 Exposure compen-sation Dial | 1) Clearance | (1) No clearance between the dial and the rubber ring. |
| | | (2) Clearance between the dial and the dial base should be 0.15 or less. |
| | | (3) Clearance between the dial and the scale plate should be 0.07 or less. |
| | 2) Accordance of the exposure compensation scale | (1) The index and the exposure compensation scale should not be disaccorded extremely by seeing from the directly above direction. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Exposure Compensation Dial | 3) Assurance of operation | (1) The stop function should surely effect. and the operation is allowed in the range indicated in the illustration below to make the proper exposure compensation.   |
| | 4) Smoothness of operation | (1) Operation should be smooth without extreme uneven feeling and difficulty. |
| | 5) Rotating force | (1) Click disengaged: 1000 ± 300g/cm |
| | 6) Pulling-up force | (1) 500 ± 120g (at the lock released position) |
| | 7) Accordance of the window of the exposure compensation plate and ASA index | (1) Cut-off should be within the width of the letter. But no cut-off at ASA 100. |
| 18 Motor Drive Part | 1) Motor Cover | (1) Protrusion from the lower plate to the cover: 0 ± 0.1 |
| | | (2) Eccentricity with the lower plate: 0.15 or less |
| | | (3) It should be surely screwed in and unscrewed. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Motor Drive Part | | (4) Plating fineness should be same as that of the lower plate. |
| | 2) Contact terminal | (1) Stage difference of the contact from the contact base: 0 ± 0.05 |
| | | (2) Depression of the contact base from the lower plate: 0.1 ± 0.2 |
| | | (3) Clearance between the lower plate and the contact base: 0.3 or less |
| | | (4) There should be no clearance between the contact base and the contact. |
| | 3) Assurance of switching of the contacts | (1) The contacts should be conductive except during the shutter operation. |
| | | (2) After the shutter operation is started. two contacts should be insulated and the rear side of the movable terminal and the camera die-cast body should be shortcircuited. |
| | 4) Conduction and insulation resistance of the contact | (1) Inner resistance upon conductive: 0.2Ω or less |
| | | (2) Insulation resistance upon insulated: 500V 50MΩ or greater |
| | 5) Operation of the release plate | (1) Should surely operate and make the release. |
| | | (2) Operating force: 180 ± 20g |
| | | (3) Stroke (release position): 2 ± 0.4mm<br>Stroke (stop position): 2.5mm or more |
| 19 Reset Button | 1) Rattling | (1) 0.15 or less |
| | 2) Assurance of operation | (1) It should surely come in and out. and the shutter dial should not reach the B when it is not depressed. |
| | | (2) When it is depressed. the dial should be able to rotate. |
| | | (3) When returning from the B to "1". the returning should be performed independently of the button. |
| | 3) Operating force | (1) 120 ± 40g |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| Reset Button | 4) Stroke | (1) Standard dimensions  Lock released position: $0.3\ ^{+0.2}_{-0.1}$ Stop position: $0\ ^{+0.15}_{-0.2}$ |
| | 5) Clearance between the front cover | (1) 0.15 or less |
| 20 Focusing Glass | 1) Assurance of mounting | (1) The focusing glass should be surely pressed at the focal position in the condition with the F key effective. |
| | 2) Assurance of the F key operation | (1) It should surely lock with "click" sound. |
| | 3) Assurance of demounting | (1) The F key should be disengaged without extreme difficulty, and the focusing glass mounting frame should be lowered and the focusing glass should be removed. |
| 21 Iris Lever | 1) Rattling | (1) Position and dimensions including the rattling should be satisfied. |
| | 2) Assurance of operation | (2) Operation should be sure. Use KC-0074G for the measurement of the position. |
| 22 Iris Interlock Ring | 1) Rattling | (1) Position and dimensions including the rattling should be satisfied. |
| | 2) Assurance of operation | (1) The coupling ring should rotate to the stopper at B. |
| | | (2) The coupling ring should surely return. |
| | 3) Smoothness of operation | (1) The operation should be smooth without extreme uneven movement and difficulty. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| 23 B Mount | 1) Appearance | (1) The mount screw should be free from biting. |
| | 2) Disaccordance of the shutter index and the index of the lens side | (1) When locking surely with the standard lens mount. the disaccordance of the index on the upper part of the body mount and the index of the lens side should be less than the illustrated value.   |
| | 3) Smoothness of the lens mounting and demounting | (1) The lens should be mounted and demounted without extreme friction. uneven movement and squeaks. |
| | | (2) Mounting and demounting rotational force should be 4 - 7kg/cm. |
| | 4) Parallelism and flatness | (1) Parallelism and flatness to the film surface should be 0.02 or less (0.025 or less. temporal) anywhere within 20 in either side from the mask center on the basis of the B mount. |
| 24 FX Knob | 1) Biting of the slit of the socket base | (1) None. |
| | 2) Rattling | (1) Vertical tolerance: 0.2 or less |
| | | (2) Click: 0.2 or less |
| | 3) Assurance of switching | (1) Switching should be made with the time lag indicated at the shutter. |
| | 4) Position of the X/FP switching | (1) The switching should be made at the position near 2/3 to FP from the center of the X/FP. |
| 25 Shutter Lock | 1) Assurance | (1) When the battery voltage is 0V - 2.32 ± 0.06V or the battery is loaded inversely. the shutter lock should function. |

| Major Check Point | Relative Functions to be Checked | Checking Method or Points of Special Attention |
|---|---|---|
| 26 WX | 1) Assurance | (1) The X contact should flash at the shutter speed of 1/60 or slower in the manual mode, and not at 1/125 or faster. |
| 27. Movable Mirror | 1) Smoothness of operation | (1) It should operate without hesitation and stoppage and squeaks. |

II. Functions and Features (Items to be checked by measuring instruments)

1. Film Advance Lever Operating Force ..... 1000g or less at the tip of the lever. when film is loaded.

2. Film Advance Lever Returning Force ..... $30^{+10}_{-6}$g at the beginning of the return stroke or thereabout.

3. Film Advance Lever Pre-advancing Force ..... 25 - 50g at the tip of the lever.

4. Shutter Button Releasing Force ..... 240 ± 50g.

5. Shutter Button Free Height ..... +1.3 ± 0.2 from the tip of the button base (The plus sign (+) means that the button is extruding from the base.)

6. Shutter Button Release Position ..... -0.2 ± 0.15

7. Shutter Button Stopping Position ..... 0.5 and over in depth in relation with button seat top surface.

8. Release Button Shaft Depth of Action ..... 7 ± 0.3 from button top surface

9. R Knob Pulling Force ..... First Step: 350 ± 100g
Second Step: 1200 ± 300g

10. Self-timer setting Force ..... 600g or less at the tip of the lever.

11. Self-timer Start Lever Operating Force ..... 160 ± 80g at the tip of the lever.

12. FX Knob Operating Force ..... 700 ± 200g at the tip of the knob.

13. Shutter Dial Operating Force ..... Middle Position: 600 ± 300g/cm
Click Position: 1500 ± 500g/cm (1600 ± 650. temporal)

14. S Lever (AUTO/MANUAL Selector Lever) Operating Force .....
330 ± 70g at the tip of the lever upon the click released.
500 ± 150g upon complete pressing to CHECK.

15. Flange-back ..... 46.0 ± 0.02, 46.0 ± 0.025 temporal

16. Tunnel Interval ..... $0.2^{+0.02}_{-0.01}$

17. Accuracy of Meter Indications

a. Indication Difference in AUTO/MANUAL switching:

1/60; ±0.3EV, BV11 F5.6
Other than 1/60; ±0.5EV

b. Accuracy of Each Indication

K = 1.3 ASA100 Voltage; 3.15V ± 0.005

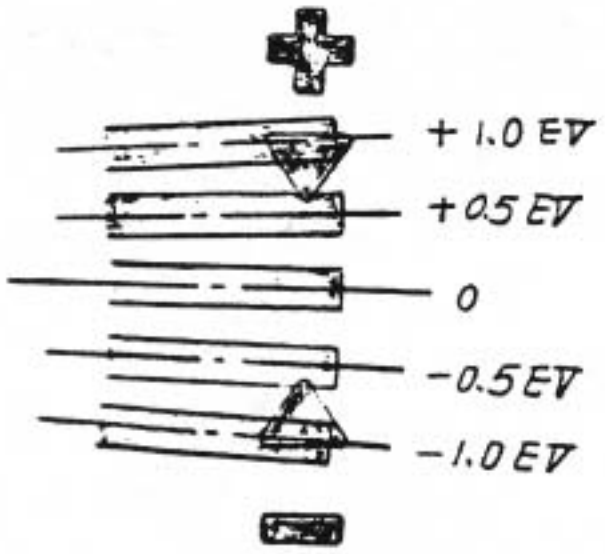
OM-2 EE Tester

| BV | S.S | FNO | Accuracy of Indication | |
|---|---|---|---|---|
| 4 | 1/2 | 2.8 | ±0.6EV | (Temporal) |
| 8 | 1/30 | 2.8 | ±0.6EV | ( " ) |
| 11 | 1/60 | 5.6 | ±0.6EV | ( " ) |
| 14 | 1/125 | 11 | ±0.6EV | ( " ) |
| 16 | 1/500 | 11 | ±0.6EV | ( " ) |

Caution: The shutter dial should be rotated from the 1/1000 side.
The aperture ring should be turned from the F16 side.

In case of LSBL7 or LSBL1

| | | | | |
|---|---|---|---|---|
| 6 | 1/2 | 5.6 | ±0.6EV | (Temporal) |
| 8 | 1/2 | 11 | ±0.6EV | ( " ) |
| 9 | 1/4 | 11 | ±0.6EV | ( " ) |
| 10 | 1/125 | 11 | ±0.6EV | ( " ) |
| 12 | 1/125 | 5.6 | ±0.6EV | ( " ) |
| 14 | 1/125 | 11 | ±0.6EV | ( " ) |
| 15 | 1/500 | 8 | ±0.6EV | ( " ) |
| 16 | 1/500 | 11 | ±0.6EV | ( " ) |




Reading of the meter indication

18. Curtain Speed ..... At 1/1000: 11.5 ± 0.1ms
The difference in the speeds of the curtains is $0\ ^{+0}_{-0}.15$. The opening curtain should be faster.

19. Manual Exposure Time

| Setting | Exposure time | Guaranteed quality |
|---|---|---|
| 1/1 | 1000 ms | 871 - 1148 ms |
| 1/2 | 500 " | 436 - 574 " |
| 1/4 | 250 " | 218 - 287 " |
| 1/8 | 125 " | 109 - 144 " |
| 1/15 | 62.5 " | 54.5 - 71.8 " |
| 1/30 | 31.2 " | 27.2 - 35.9 " |
| 1/60 | 15.6 " | 13.6 - 17.9 " |
| 1/125 | 7.81 " | 6.81 - 8.97 " |
| 1/250 | 3.91 " | 3.40 - 4.49 " |
| 1/500 | 1.95 " | 1.59 - 2.40 " |
| | | (1.53 - 2.49 " Temporal) |
| 1/1000 | 0.98 " | 0.77 - 1.43 " |

20. Uneveness of Exposure

1/1 - 1/250: 0.15 EV or less
1/500: 0.3 EV or less
1/1000: 0.35 EV or less

21. Disorder of Exposure ..... 10 continuous measuring values of exposure time should be all within the above standards.

22. Contact Efficiency of X Contact ..... Max. 60% or above and minimum 50% or above at the interval of 1ms. in slow speed including 1/60 sec.

23. Contact Efficiency of FP Contact ..... 70% or above at the interval of 2.5ms.

24. Insulation Resistance and Contact Resistance ..... Insulation Resistance: 30MΩ at 500V
Contact Resistance: Ascertain continuity at 3V

25. Time Lag for X Contact ..... At 1/60 sec.. it should be switched in within 1.5ms of the closing action of the closing curtain. upon completion of the opening curtain opening.

26. Time Lag for FP Contact ..... It should be switched in at 8 - 14ms. prior to commencement of the first curtain action.

27. Accuracy of Automatic Exposure ..... ±0.6EV at 1/1000 sec. or equivalent and ±0.4EV at 1/500 sec. or slower in the range BV2 - BV16 at ASA100, K = 1.3 with fresh batteries (two).

28. Longest Exposure Time for AUTO ..... The shutter should be closed within 60 sec. - 20 min at ASA100 in complete darkness.
(30 - 60 sec. in temporal is also available.)

29. Longest Exposure Time for OFF ..... The shutter should be closed within 35ms - 140ms at ASA100 in complete darkness.

30. Temperature Characteristic, -20 - 60° ..... At ASA12 - 400. automatic exposure accuracy; the changing amount should be within the following value against the characteristic at the room temperature.

| | |
|---|---|
| 1/250 sec. or slower: | 0.3EV |
| 1/500 or equivalent: | 0.4EV |
| 1/1000 or equivalent: | 0.5EV |

31. Humidity Characteristic ..... After leaving in 20°C and 90% humidity for two hours. the changing amount in this condition should be within 0.5EV at ASA100 and 10 sec. or equivalent as compared with the characteristic in the normal humidity.

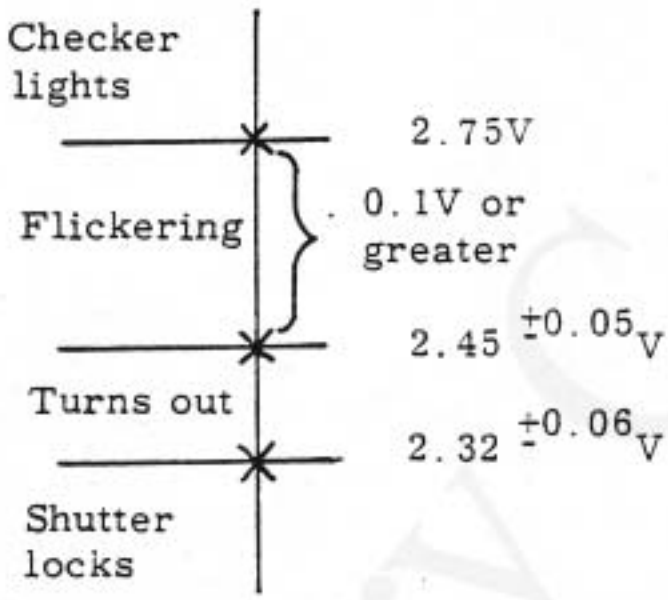
32. Difference between Automatic Exposure and Indication ..... Real exposure should be 20ms or longer when the exposure meter indicates 1/30.

33. Voltage Characteristic

a. The shutter lock should not activate in the voltage range of 3.2V - before-lock value.

b. The shutter lock should operate in the range of lock voltage - 0V.

c. The battery checker and the voltage should be as follow.




34. Change in Exposure against Voltage Fluctuation ..... The changing amount should be within 0.2EV for either AUTO or MANUAL in the range of 3.2V - lock voltage.

35. Current Consumption ..... At AUTO and MANUAL
12mA or less at 3.15V

At B
15mA or less at 3.15V

At CHECK
15 - 20mA at 3.15V

At meter
800μA at 1/1 sec.

36. Vertical Discrepancy in Positioning the Actual Picture ..... The actual picture should be beyond 0.3mm or more from the perforations.

37. Interval between Picture Frames ..... 1.85 ±0.5